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## The Use of Electronic Health Records Data for Public Health: A Snapshot of Current Practices in Nebraska's Local Health Departments

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# The Use of Electronic Health Records Data for Public Health: A Snapshot of Current Practices in Nebraska's Local Health Departments

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Service Learning/  
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## **Abstract**

**Background:** Public health issues are constantly changing and require local health departments (LHDs) to continually evolve in their approaches to address these issues. Advancements in health information technology (HIT), such as electronic health records (EHRs), play an important role in the collection of data that can be used to improve population health.

**Objective:** The purpose of this project was to assess the current use of electronic health records data by Nebraska's local health departments and identify the data or tools they are using to address the health needs of the populations they serve.

**Methods:** In this study, a Mixed-Methods approach was used to collect data, using both quantitative and qualitative methods. A survey questionnaire was administered to all local health departments in Nebraska. Purposive sampling was used to select three Nebraska local health department directors and two Nebraska Health Information Initiative (NeHII) employees for semi-structured interviews.

**Results:** The study questionnaire garnered responses from 14 local health departments in Nebraska. A majority of respondents (64.3%) indicated that their department currently uses electronic health records data for public and population health activities. Local health departments currently using EHRs data all reported the use of Immunization Registries, followed by 88.9% who used Electronic Laboratory Reporting, and 77.8% who used Syndromic Surveillance Data. Approximately 66.7% of respondents always or often used electronic health records for Health Needs Assessments, Strategic Planning, and Program Planning. In departments not currently using EHRs data, 66.7% had no

plans to implement use in the future. The most commonly cited barrier by health departments to the use of such data was the lack of funding needed to implement use, followed by concerns of the department's capacity or resources to use the data. These were corroborated by interview participants who also cited a lack of funding and resources as primary barriers to the use of EHRs data for public health. The potential for use was seen with most respondents (71.4%) stating that electronic health records had a very useful effect for improving public and population health. The utilization of Nebraska Health Information Initiative tools was seen in most local health departments (64.3%). All departments using NeHII reported having received training in NeHII tools, with more than half reporting using NeHII multiple times a week. A lack of knowledge of NeHII tools was cited as a key barrier to use by departments not using NeHII. Most respondents were favorable of NeHII stating it was important for public health, easy to use, and was a part of workflow.

Conclusion: To better meet the public health needs of Nebraska, it is imperative to identify the current practices of local health departments to determine areas for improvement. The use of electronic health records data is an important technological tool for helping local health departments in Nebraska achieve better health outcomes in the state. Barriers to electronic health records data use must be addressed and a new emphasis placed on securing resources to improve utilization.

## **Introduction**

**Placement Site:** Nebraska Association of Local Health Directors (NALHD)

The Nebraska Association of Local Health Directors is a non-profit organization, founded in 2010, that strives to improve the health of the people of Nebraska. It aims to be the “center of excellence in leadership, best practices, research, partnership, support and training” for Nebraska’s local health departments (NALHD, 2017). NALHD’s stated mission is to “amplify the impact of local public health departments at the state and local level by leveraging resources, pursuing organizational excellence, facilitating peer learning, and building collaborative systems” (NALHD, 2017). NALHD is the state affiliate of the National Association of City and County Health Officials (NACCHO) and is Nebraska’s State Association of City and County Health Officials (SACCHO). Membership in NALHD is open to directors of local health departments in Nebraska and currently represents 19 local health departments covering 92 of the state’s 93 counties.

The Nebraska Association of Local Health Directors is staffed by health professionals and educators with extensive experience in public health and program coordination. These professionals endeavor to improve Nebraska’s health through program initiatives and training that address issues such as education, emergency preparedness, housing, vaccinations, health literacy, and the needs of Veterans and their families (NALHD, 2017).

Through partnerships and collaborations with government agencies, academic institutions, health organizations, advocacy groups, and others, NALHD members work

in helping to determine health policies, implementing evidence-based models of public health, and identifying priority initiatives (NALHD, 2017).

Issues Being Addressed:

The problem of unmet health needs and a lack of services is still pervasive in Nebraska and across the United States, despite the efforts of local and state health departments. This is in part due to the lack of adoption and implementation of new advancements in health information technology for public health. Local health departments provide many public health services and are crucial to improving health outcomes but are hampered by a lack of knowledge and access to available health technologies and technological tools. These gaps in knowledge and lack of access must be identified to better assess community health needs and develop strategies and programs to improve the health of whole communities.

Importance of the Project to the Organization and to the Scientific Community:

This project is of significant importance as it helps gain insight on the use of electronic health records data in Nebraska's local health departments for public and population health. The use of both a survey questionnaire and interviews with local health department directors, aids in addressing the gaps in knowledge mentioned above. Interviews with NeHII employees, which is Nebraska's Health Information Exchange, provides additional information. The data collected will assist NALHD in its efforts to improve the state of health in Nebraska by identifying whether LHDs are making use of EHRs and if not, what are the primary barriers they are facing to implementing use. It is important for NALHD to know what are the types of data being

used or the types of data LHDs would find useful to guide current or future initiatives. This extends to the use of population health tools offered by the Nebraska Health Information Initiative. To achieve this, persons highly knowledgeable of the health information technology tools offered by NeHII were sought for interviews to supplement study data. Such a study had not been undertaken previously. By gaining a better understanding of the use of EHRs by local health departments, the project will help NALHD identify current practices and potential gaps in use and develop recommendations to encourage greater use of electronic health records data.

#### Objectives:

The purpose of this research project is to improve health services and programs in local health departments across the State of Nebraska by assessing the use of electronic health records data and making recommendations to healthcare organizations, such as NALHD. To achieve this, information on current practices in LHDs regarding the use of EHRs data was collected to gain a better understanding of challenges faced by local health departments in addition to factors that promoted use.

#### Literature Review:

Constantly changing public health needs require local health departments to find new approaches to improve community health outcomes.

Local health departments provide many critical public health services that have a major impact on improving population health, which is defined as “the health outcomes of a group of individuals, including the distribution of such outcomes within the group” (Friedman, Parrish, & Ross, 2013). The activities performed by LHDs are based on the



three core functions of public health (Assessment, Policy Development, and Assurance) and the related 10 essential services that include such services as monitoring health status in communities, developing policies and plans, enforcing laws and regulations, evaluation of health services, and research (Centers for Disease Control and Prevention, 2011). According to a recent study, local health departments on average perform more than 30 activities and services, with the number performed increasing with larger populations (Shah, Luo, & Sotnikov, 2014). The study further states that some of the most commonly performed activities include adult immunizations, child immunizations, communicable/infectious disease surveillance, Tuberculosis screening, environmental health surveillance, nutrition education, tobacco control, and chronic disease prevention. Population size is an important factor to consider as it affects the service priorities of local health departments. With many different factors affecting community health needs, local health departments are constantly looking for new ways to help healthcare systems achieve the 'Triple Aim' (improving the patient experience, improving the health of populations, and reducing the per capita cost of health care) of improving healthcare systems (Institute for Healthcare Improvement, 2017).

To address issues of public health in the State of Nebraska, it is imperative to know the current status and rankings of the state regarding various health concerns facing local health departments. According to the most recent report by the United Health Foundation, Nebraska ranks 12<sup>th</sup> overall for health in the United States with primary health challenges being a high prevalence of excessive drinking, a high prevalence of obesity, a high incidence of pertussis, and a high prevalence of occupational fatalities (United Health Foundation, 2017). Other findings of note include a decrease of 8% in

immunizations for children (aged 19-35 months), a 7% increase in premature deaths, and a rank of 32<sup>nd</sup> for disparities in health status. Excessive drinking is a grave concern with Nebraska ranking 42<sup>nd</sup> in the US, as 20.4% of adults reported either binge drinking or chronic drinking. When compared to US median results, Nebraska sees more alcohol impaired driving deaths (36% vs 30%) and more sexually transmitted infections per 100,000 population (401.3 vs 294.8) (County Health Rankings, 2017). Mental health is also an issue in the State of Nebraska. When considering the measures of a low prevalence of mental illness and higher rates of access to mental health care for both adults and youth, Nebraska ranks 27<sup>th</sup> in the US, including a ranking of 35<sup>th</sup> for adults and 26<sup>th</sup> for youth (Mental Health America, 2017).

Addressing these and other important health issues will require local health departments today to collect, interpret, analyze, and disseminate information faster and on a much larger scale. An important method is through the use of health information technology, such as data obtained from electronic health records. An electronic health record is defined as “a longitudinal electronic record of patient health information generated by one or more encounters in any care delivery setting. Included in this information are patient demographics, progress notes, problems, medications, vital signs, past medical history, immunizations, laboratory data, and radiology reports” (Menachemi & Collum, 2011). Recent health policies and developments in the United States healthcare system such as the Affordable Care Act (ACA) and the Health Information Technology for Economic and Clinical Health (HITECH) have stimulated the adoption and implementation of health information technology (Foldy, Grannis, Ross, & Smith, 2014; Williams & Shah, 2016). This has led to a need for creating new standards

for use regarding the information management capabilities of US health departments, according to the Public Health Accreditation Board (Foldy et al., 2014). As mentioned above, the enactment of the ACA has greatly altered the United States healthcare system with millions more Americans insured and accessing care along with new regulations aimed at increasing the number of clinical and preventive services offered. To meet these new demands for health services, local health departments will need to stay abreast of new developments in the field of health information technology. This is further emphasized by the need for health departments to assess and meet patient needs by using timely and coordinated information for assessing health needs, formulating strategies, and improving program planning.

Electronic health record data is an essential, but often under-utilized, public health tool for local health departments with the potential to greatly improve population health. A recent study found that only 38.4% of LHDs across the United States use electronic health records, but 84.7% of those LHDs without an EHRs systems reported having an implementation plan for a selected system (McCullough & Goodin, 2016). The study also highlighted the important relationship between population size and EHRs use. LHDs serving large populations (>500,000) were more likely to use EHRs than those serving small populations (<50,000). This is a meaningful factor to take into consideration, especially for local health departments serving more rural communities. Another study determined that only 6% of local health departments had conducted a formal readiness assessment for a health information exchange while only 27% had conducted informatics training in the past 12 months (Williams & Shah, 2016).

It is important to understand how electronic health information is used and the various means by which they can support public health. Some examples include:

- Data collection: Health departments need to constantly monitor the health status of populations, collect and analyze data on morbidity and mortality, and understand social determinants of health (such as socioeconomic status and education level). EHRs can help in public health surveillance and can provide data on subpopulations and underrepresented geographic areas to better understand illness trends. The collection of EHRs data also has potential use in developing health policies. (Tomines, Readhead, Readhead, & Teutsch, 2013)
- Public health investigations: Information is needed for health departments to quickly analyze, diagnose, and investigate health concerns. EHRs help reduce investigations times, thereby improving public health responses to bioterrorism events and infectious disease outbreaks. (Tomines et al., 2013)
- Bidirectional communication between clinical care providers and public health entities: EHRs data help identify community-level disease trends which can direct immediate clinical decision rules. (Kukafka et al., 2007)

Further review is needed by local health departments to assess current electronic health records use and capabilities to help more efficiently and effectively provide public health services.

## **Methods**

**Research Question:** What are the current practices of Nebraska's local health departments in using electronic health records data for addressing Nebraska's public health needs, formulating strategies, and developing programs?

**Study Design:** To assess current practices, this mixed-methods study consisted of 3 parts -

- A questionnaire administered to local health departments in Nebraska
- Semi-structured phone or in-person interviews with local health directors in Nebraska
- Semi-structured phone or in-person interviews with NeHII employees

In accordance with criteria set forth by the Institutional Review Board (IRB) of the University of Nebraska Medical Center, this study was qualified by IRB as 'Exempt Research' and did not require further approval.

**Study Population and Sample Size:** For the quantitative section of this study, the target sample population for data collection was the 19 local health departments in Nebraska associated with NALHD. Responses were received from 14 departments. For the qualitative section, 3 Nebraska local health directors and 2 NeHII employees were interviewed. Interview participants were recruited using purposive sampling.

**Data Sources and Data Collection Methods:** The quantitative section of the study was carried out by distributing an electronic self-administered questionnaire to all 19 Nebraska local health departments associated with the NALHD via SurveyMonkey, an

online survey software. NALHD-associated health departments include Scotts Bluff County Health Department, which is a part of the Panhandle Public Health District, and excludes Douglas County Health Department which is not a member of NALHD. Local health directors of the 19 associated LHDs, or by persons identified by directors as most knowledgeable of HIT use by the department, were asked by NALHD to complete the questionnaire. Participants were notified of a two-week period for completion. Reminders were also sent after four and ten days of the questionnaire open date to increase the participation rate.

The survey questionnaire was developed by researchers from the UNMC College of Public Health with input from NALHD employees. For the purpose of this study, electronic health records data was defined as Syndromic Surveillance, Immunization Registries, or Electronic Laboratory Reporting. The questionnaire consisted of questions on the current use of electronic health records data for public and population health, the types of EHRs data used and for what purposes, and whether local health departments used EHRs for their health needs assessments, strategic planning, or program planning. Local health departments not currently using EHRs data were asked whether they had plans to implement use and when. Questions also included whether local health departments had previously participated in training on EHRs data use, or planned to participate in training, and on participant's perceived barriers to the use of EHRs for public health. The questionnaire also asked about department utilization of population health tools offered by NEHII. This included questions on training of department staff of NeHII tools, frequency of use, for what purposes the department used NeHII data/tools, and barriers to the use of NeHII.

The qualitative component of this study comprised of semi-structured interviews to collect data from selected local health directors and NeHII employees. Interview participants were determined on the recommendations of both UNMC researchers and NALHD employees. Health directors that completed the questionnaire met the basic criteria for interview selection. Selected health directors were recruited from departments that used EHRs and from those that did not. Health directors were also selected from departments that serve more rural populations and those that serve more urban populations.

The interview phase of the study was carried out following the close date of the survey questionnaire. One-on-one interviews were conducted either by phone or in-person with the average length of interviews lasting between 20-30 mins. Prior to the start of the interview, informed consent was obtained from participants in the study in addition to permission to record audio of the interview for research purposes. For the interviews, electronic health records data was again defined as Syndromic Surveillance, Immunization Registries, or Electronic Laboratory Reporting. The interview questions were based off the questionnaire so as to gain more depth of knowledge, with some questions differing between health directors and NeHII employees. The interviews of local health directors included questions about their responsibilities (especially regarding the use of Health Information Technology), whether they currently use or ever used electronic health records data, what type of data and for what purposes, types of data they would like to use, barriers their department has faced in using EHRs, whether they use NeHII and for what, frequency of NeHII use, and what changes would make NeHII more useful to them. Participants from NeHII were asked about their experience

with EHRs, types of NeHII data available for local health departments to use and types that could be available in the future, the process by which LHDs can access NeHII tools, barriers to LHDs using NeHII, interaction of NeHII staff with LHDs, familiarity with the use of EHRs data for public and population health, and perceived barriers to the use of EHRs data for public health.

Statistical Methods: To enter and analyze the quantitative data from the questionnaire, Microsoft Excel and SurveyMonkey analytic tools were used. The data was summarized using descriptive statistics including counts, percentages, frequencies, means, medians, and cross-tabulations.

For the qualitative data from the interviews, the framework approach was used for data analysis. Transcriptions of interviews were prepared and responses were coded to create a coding framework (see Appendix D) that was applied to the transcribed interviews. Interpretation of the data then involved identifying key issues/themes to explain the results.



## **Results**

### **Demographics:**

In this study, a total of 14 of Nebraska's local health departments participated in the questionnaire out of 19 NALHD-associated departments that were contacted, for a response rate of approximately 74%. For the purposes of this study, questionnaires that were incomplete or were duplicate responses from a department were excluded.

The participating health departments included –

- Central District Health Department
- Dakota County Health Department
- East Central District Health Department
- Four Corners Health Department
- Lincoln-Lancaster County Health Department
- Panhandle Public Health District
- Public Health Solutions
- Sarpy/Cass Health Department
- South Heartland District Health Department
- Southeast District Health Department
- Southwest Nebraska Public Health Department
- Three Rivers Public Health Department
- Two Rivers Public Health Department
- West Central District Health Department

For the study, local health directors were requested to have persons most knowledgeable of health information technology use in their departments respond, whether this was the director themselves or others identified in their department. Respondents of the questionnaire were primarily local health directors (~ 64%) with other participants holding positions including Health Services Director, Public Health Nurse (PHN), Information & Fiscal Division Manager, Chief Public Health Officer, and Community Health Nurse (CHN).

Interviews were conducted with 3 of Nebraska's local health directors and 2 NeHII employees:

Participating health directors were from the following local health departments –

- Four Corners Health Department
- Panhandle Public Health District
- South Heartland District Health Department

Participating NeHII employees included –

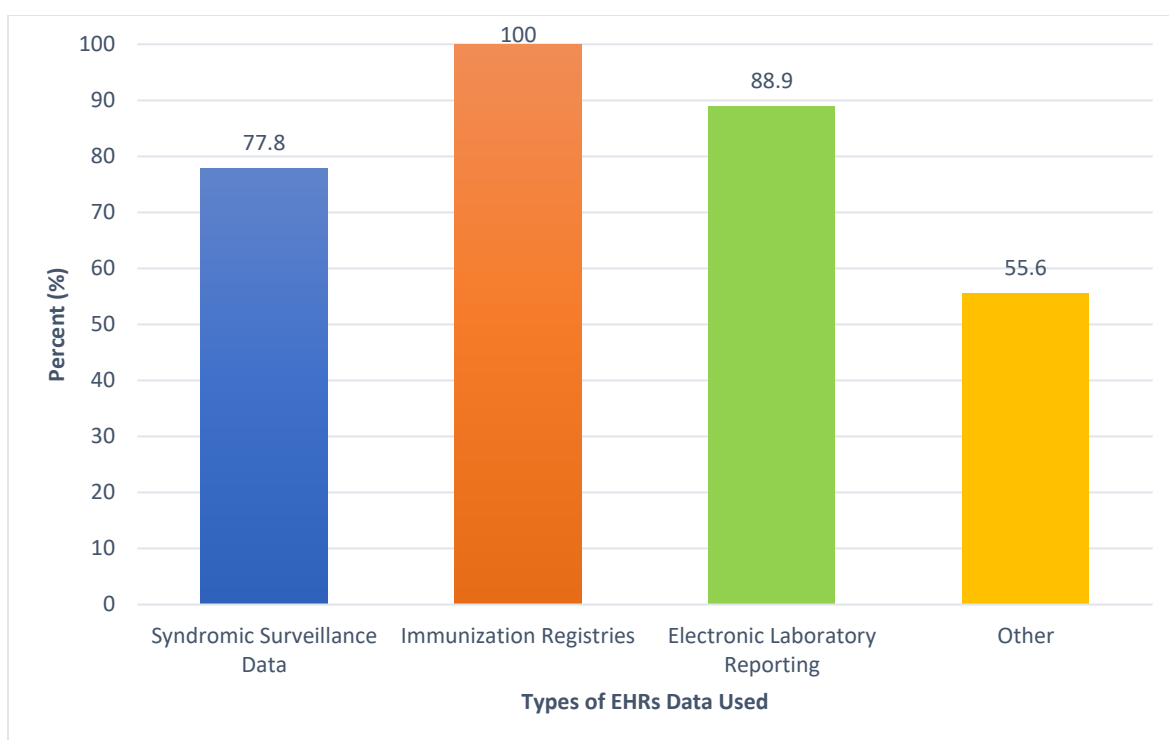
- Chief Executive Officer
- Director, Business Development

#### Electronic Health Records Data:

The use of electronic health records data for public and population health varied between local health departments with nine departments (64.3%) stating they currently use EHRs data, while five (35.7%) stated they do not.

For local health departments currently using EHRs, the start dates for using EHRs ranged from as early as 2000 to having just started in 2016, with a median of 12 years of use.

**Figure 1: Types of EHRs data current used by LHDs in Nebraska (n=9)**



As mentioned earlier, for the purpose of this study, electronic health records were defined as either Syndromic Surveillance Data, Immunization Registries, or Electronic Laboratory Reporting. As seen in Figure 1 above, all nine departments using EHRs data stated using Immunization Registries as part of their workflow, with 88.9% using Electronic Laboratory Reporting, and 77.8% using Syndromic Surveillance Data.

Approximately 56% stated using other sources of data as well, including the use of NeHII, Medical Records, and Medical Clinic EHR. One participant stated:

*“We also collect and use EHR data to support direct services for immunizations, STI, refugee, home visitation and dental. We analyze the data on a regular basis to improve services and outcomes. We interact with EHR data as both the public health authority and as a direct service provider.”*

*“We pretty much started off with the electronic laboratory reports coming in through the NEDSS system...there’s the Guardian System as well...”*

**Table 1:** The extent to which Local Health Departments rely on EHRs data (n=9)

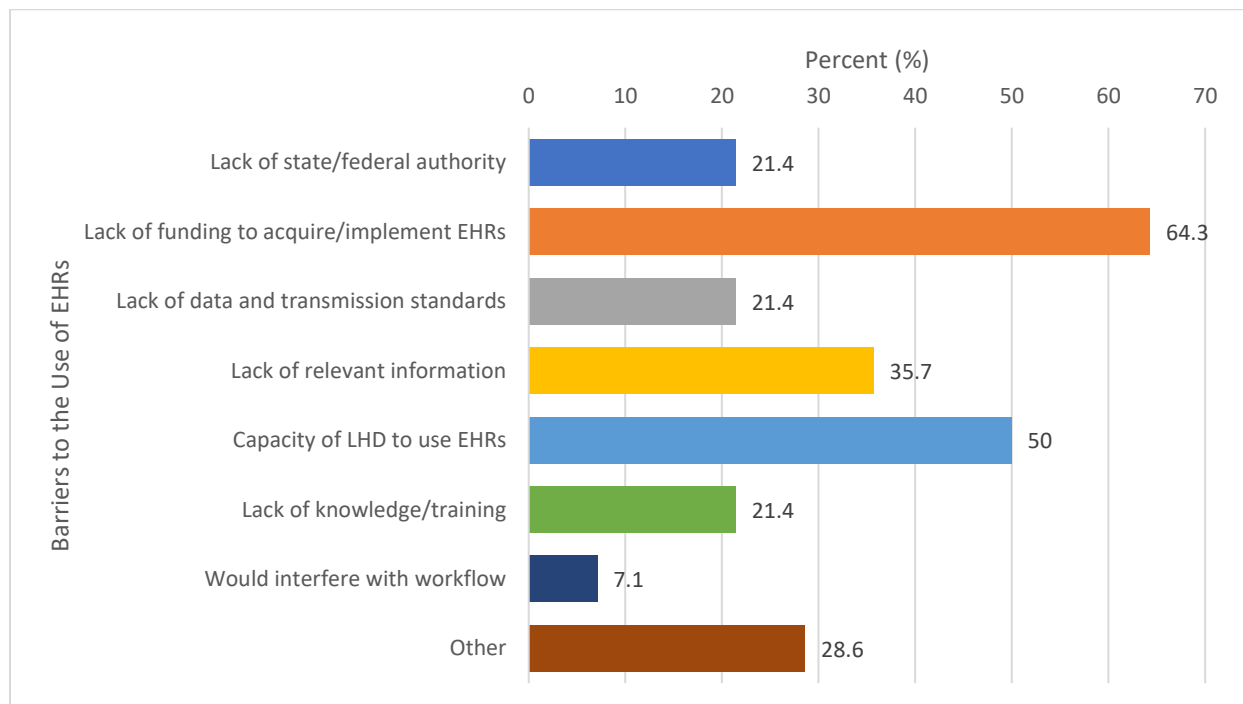
	Always	Often	Very Little	Not at All	Don't Know
<b>Health Needs Assessments (HNAs)</b>	22.2%	44.4%	11.1%	11.1%	11.1%
<b>Strategic Planning</b>	11.1%	55.6%	22.2%	0.0%	11.1%
<b>Program Planning</b>	33.3%	44.4%	11.1%	11.1%	0.0%

In Table 1, we see the extent to which local health departments rely on electronic health records data for Health Needs Assessments (HNAs), Strategic Planning, and Program Planning. The majority of health departments stated they used EHRs ‘Always’ or ‘Often’ with 66.7 % using them for Health Needs Assessments, 66.7% for Strategic Planning, and 77.8% for Program Planning purposes. When participants were asked

how likely they were to recommend to other LHDs the use of electronic health records data for HNAs, Strategic Planning or Program Planning; the majority (8 out of 9) responded 'Definitely' or 'Probably', with only one participant stating, 'Probably Not'.

Participants from local health departments not currently using electronic health records data were asked about future plans to begin using EHRs data. Two (33.3%) departments planned to implement use in the future while 4 (66.7%) stated they did not plan to use the data. Only one department stated an implementation timeline of within 7-12 months.

**Figure 2:** Perceived concerns or barriers to the use of EHRs for Public Health



Participants were asked to indicate what they perceived as concerns or barriers to the use of electronic health records for public health, as seen in Figure 2. A lack of funding needed to acquire or implement EHRs data for department use was the most commonly cited barrier at 64.3%. Half of respondents cited the capacity of local health departments to select, adopt, or implement EHR for use (e.g., staff resources) as a major barrier. Over one third (35.7%) indicated that a lack of relevant information to their department was another important concern. Other important barriers to the use of electronic health records data were a lack of explicit state or federal authority for use of EHR data, a lack of EHR data and transmission standards, and a lack of technical knowledge and training of department personnel. Additional participant comments and concerns cited included -

*“Confidentiality of who supervises the person to access the files/information.”*

*“We are working on adding additional epidemiology resources to work with data through NeHII and the state. We have to wait until a sufficient number of local hospitals and health care providers are connected to NeHII and/or the state so that the data is available. We have been working to build capacity and will continue to do so.”*

*“Funding for up keep [of] EHR...Different EHRs being used so sharing information is difficult...Cost to interface with other electronic reporting systems such as labs or immunization registries”*

*“We do not have a ‘program’ that would really require the use of EHR”*

*“Cost would be a huge one...the time and maintenance, I don’t see us using it...”*

*“I think the big thing right now is just getting all these systems to interface with each other, the cost of doing that...the compatibility, and then of course too, who do you share your data with...”*

*“You have to go through a lot of processes to get the data from the state. It’s not something you can easily query...We have used some national formats like Network of Care, but we haven’t found them to be accurate...”*

Study participants were asked whether they or other department staff had received training in the use of electronic health records data. A majority (92.9%) responded ‘yes’, with only one respondent indicating ‘no’. When participants were asked when the last training was held, 38.5% indicated within the last 6 months, 7.7% indicated within the last 7-12 months, and 38.5% indicated within the last 1-2 years. Respondents were also asked to describe how training was conducted and what topics were covered –

*“One staff member who worked previously at a primary care clinic and used their EHR.”*

*“Self-training for updates which is provided by the EHR”*

*“Taken at previous job, regarding utilization and efficiency”*

*“For staff providing direct services, training is conducted through on the job training as well as on-line resources, webinars and super users help other staff. For Epidemiology staff, training in tools is sometimes provided by the state.*

*Epidemiologists primarily already have training in statistical analysis but may need training in specific analytical tools. We host training in Logi Analytics about every 4-5 years, training is also available on-line and through forums. As we start to use Essence, the staff work with the state and utilize on-line training. We also have an internal Report Developers Group that includes epidemiologists, quality improvement staff, programmers and other IT staff. Members of the group work together to solve problems and cross train as needed.”*

*“Webinars and training videos”*

*“Related to 1422”*

In regard to participating in training in the future, 78.6% of respondents indicated that they did plan to participate while 21.4% indicated they did not. In describing their reason as to why they did not plan to participate in future training, one respondent stated –

*“Not unless we have a strategy and budget for adopting an EHR”*

When participants were asked when they planned to participate in training in the future, 36.4% indicated within 6 months and 27.3% indicated within 7-12 months, while the remaining respondents were unsure.

Participants in the study were also asked what they perceived as the effect of EHR data for improving public and population health. A majority of respondents (71.4%)



stated they found EHRs to be 'Very Useful', while others indicated 'Somewhat Useful' (14.3%) or were 'Neutral' (14.3%).

Nebraska Health Information Initiative (NeHII):

The utilization of population health tools offered by NeHII varied between local health departments in Nebraska with nine departments (64.3%) stating they currently use NeHII while five departments (35.7%) stated they do not.

When looking at local health departments currently using NeHII, the departments using NeHII varied from as long as 5 years to starting as recently as 1 month ago, with a median of 1 year of use. Respondents were then asked to describe how NeHII was useful to them –

*“Useful for labs. Limited use for provider notes/dictation (as they are not yet in system or available)”*

*“Very useful for disease investigation in completing public health disease tracking.”*

*“At the present--we use NeHII to help with disease investigation and follow-up. We plan to expand this use significantly as more providers in Lincoln begin to participate in NeHII. I expect that as that happens our use of NeHII will be daily.”*

*“We use it for Disease Surveillance.”*

*“Use it to look up disease surveillance information on clients”*

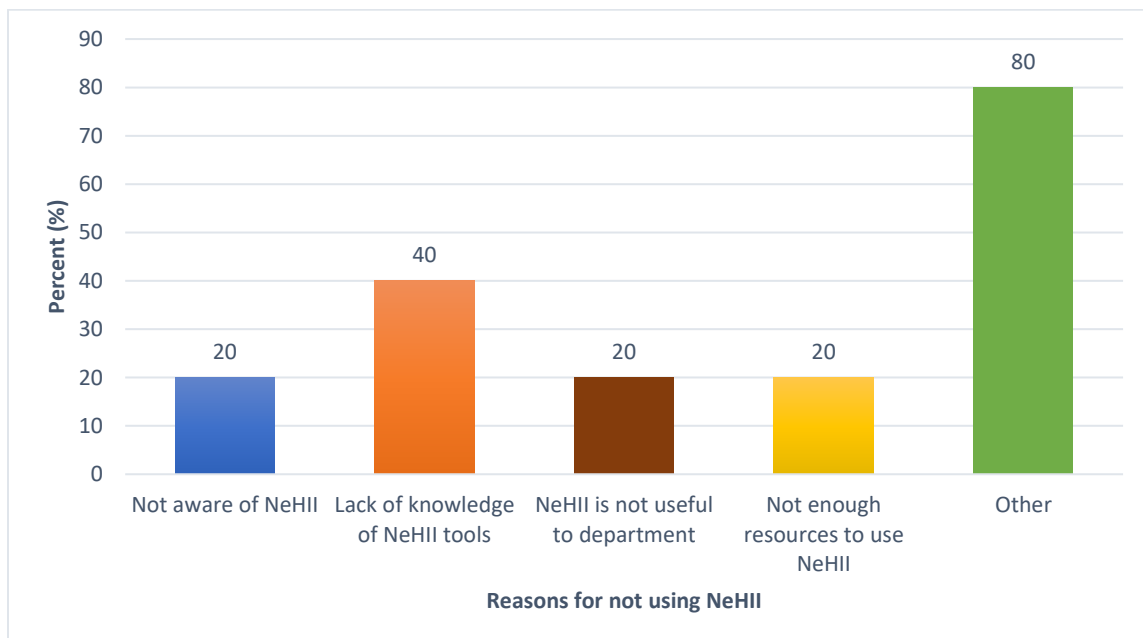
*“Very useful in conducting investigations for communicable diseases”*

*“Disease Surveillance, continuity of care for patients to look up procedures/information at another facility, monitor prescription medications”*

*“A nice tool when you are doing surveillance...when investigating someone who has been hospitalized and moved...for Reportable Disease Investigation...”*

When asked whether the respondent or other department staff had received training in NeHII tools, all nine (100%) respondents from departments using NeHII confirmed that they had. These respondents were also asked how often they used NeHII. More than half (55.6%) indicated ‘Nearly always’ (few times a week), 33.3% indicated ‘Often’ (few times a month), and 11.1% indicated ‘Sometimes’ (few times a year).

**Figure 3: Reasons for not using NeHII (n=5)**



Study participants from health departments not currently using NeHII were further asked about their reasons for not using NeHII. From Figure 3, we see that the most common reason was a lack of knowledge of NeHII tools. Other reasons included respondents not being aware of NeHII, respondents indicating that NeHII is not useful to their department, and that there were not enough resources for their department to make use of NeHII. Additional comments included –

*“Currently NeHII doesn't have enough useful local public health data.”*

*“No current access”*

*“Our local hospitals/resources are not yet participating in NeHII”*

*“I think there is useful information but haven't done it yet.”*

*“I am familiar with it...but I am not sure how much of that is related to our local data at this point...”*

*“We have one big problem with NeHII right now...our local hospitals are not on NeHII...we're like a big, black hole for NeHII...”*

In Table 2 below, we see that 71.4% of respondents indicated that they either ‘Strongly Agree’ or ‘Somewhat Agree’ that NeHII is easy to use, has data tools that positively affect their decision-making, is a part of department workflow, is important for public health, and were satisfied with NeHII. Other comments to note on NeHII were –

*“We have just received our QCDR certification and that's quality of reporting data, the registry for risk-based payment...and we have also applied to become a*

*Qualified Entity, or a QE...to enforce standards, because we see a lot of issues with standards...”*

**Table 2:** Experience of Local Health Department with NeHII

	Strongly Agree	Somewhat Agree	Somewhat Disagree	Do Not Agree	N/A
<b>NeHII is easy to use</b>	50.0%	21.4%	0.0%	0.0%	28.6%
<b>Data tools positively affect decision-making</b>	28.6%	42.9%	0.0%	0.0%	28.6%
<b>NeHII is part of workflow</b>	35.7%	35.7%	0.0%	0.0%	28.6%
<b>NeHII is important for public health</b>	57.1%	14.3%	0.0%	0.0%	28.6%
<b>Satisfied with NeHII</b>	35.7%	35.7%	0.0%	0.0%	28.6%

Additional comments shared by participants during the study were –

*“I hope we can have additional statewide conversations about adopting EHR and/or a bidirectional referral mechanism to connect local health departments, providers, and community resources with the ability to close the loop on managing patients. Currently no efficient method of connecting these different aspects of a patient's health experience.”*

*“The use of EHR data for population / public health is critical to the future of local public health. The ability to monitor, analyze and use near real time data on population health is vital to community planning to address health issues and to evaluate the impact of interventions. The uses of EHR data for syndromic surveillance and for disease investigation and follow-up is already well established. The access to provider EHR data reduces the time lapses from disease reports to effective interventions to stop the spread of disease. The uses of EHR data to help with the efforts to address chronic disease across the community is the challenge for the next five-ten years.”*

## **Discussion/Recommendations**

The purpose of this study was to assess the current practices of Nebraska's local health departments in the use of electronic health records data for public and population health activities. The use of EHRs in Nebraska's local health departments was found to be much higher than the national average, with 64.3% of Nebraska LHDs using EHRs data compared to only 38.4% (McCullough & Goodin, 2016) seen across the United States. However, when looking at local health departments not currently using EHRs, 84.7% of LHDs in the US reported having plans to implement use (McCullough & Goodin, 2016). This was significantly higher, and more than double the percentage, that was found in Nebraska, with only 33.3% of LHDs indicating that they planned to implement EHRs use in the future. Only one department had set a definitive timeline for implementation. Given the higher adoption rate but lower implementation plan rate in Nebraska, it is important to note that 46.2% of LHDs had conducted training in the use of EHRs within the last 12 months. This was much higher than the frequency in local health departments across the US, which was 27% (Williams & Shah, 2016). From this we can conclude that while Nebraska is above the national average for EHRs data use by LHDS, it lags far behind current trends in the country in which there is a strong movement towards increased use of the data that electronic health records can provide.

To understand why so many of Nebraska's local health departments have no plans to implement the use of EHRs data, it is imperative to understand the barriers or concerns LHDs have that prevent them from doing so. The most common reason cited was cost. There was consensus that a lack of funding prevented local health departments from utilizing EHRs, including primarily workforce and infrastructure issues.

Also mentioned were the maintenance costs of health informatics systems and the costs associated with getting different EHRs systems to interface with each other to facilitate the sharing of information. This was corroborated by interview participants who stated that other avenues for funding were being pursued or that free resources were under consideration. The lack of funding was also a factor in the second most cited barrier, that local health departments lacked the capacity (e.g., a dearth of staffing resources) to adopt and implement the use of EHRs. Another critical barrier was a lack of relevant information to meet the needs of individual health departments. Local health departments differed in the activities performed or the programs they offered, which require pertinent data to succeed. A common refrain amongst interviewees was that there is insufficient data at the local and county level, especially given the rural populations many of them serve. The lack of relevant data was also cited as a barrier to using the population health tools offered by NeHII. A frequent reason mentioned was that local hospitals and clinics were not connected to the NeHII system. These are important concerns when looking for data sources to provide information needed for assessing community health needs and formulating strategies. Additionally, both directors and NeHII employees felt bi-directional communication between hospitals/providers with public health entities was crucial. The types of information being communicated and shared must then be examined.

When looking at the types of health data being used by local health departments in Nebraska, Immunization Registries are universally used by LHDs using electronic health records data. Syndromic surveillance or disease surveillance was also commonly used, at 88.9% amongst departments using EHRs, since it helps in early detection of

disease outbreaks and in monitoring disease trends. From comments made by participants, this is also the central reason for using NeHII. Benefits mentioned include assisting in disease investigations, public health disease tracking, patient follow-up (especially when patients use multiple facilities for treatment), continuity of care for patients, and investigations of reportable and communicable diseases. Other sources of data used by local health departments included medical records from healthcare providers, NEDSS (National Electronic Disease Surveillance System), and the E-Alert system of the Joint Commission.

A common source of population health data tools mentioned by participating health departments was NeHII, the Nebraska Health Information Initiative, which is the State of Nebraska's online Health Information Exchange. However, despite the many reasons for which local health departments use NeHII, only 64.3% of LHDs reported currently using NeHII as a part of their workflow. In health departments that did, NeHII was an integral part of the department workflow with 55.6% of respondents stating they used NeHII multiple times a week while 33.3% indicated multiple times a month. Given the frequent use of NeHII by most local health departments, a better understanding of why others do not is required. The most commonly cited barrier to using NeHII was that local health departments lacked knowledge of the data tools offered by NeHII. This is interesting to note as NeHII employees explained that NeHII conducted regular presentations and trainings on the services they offered. From the study, we see this assertion on trainings backed up, since all LHDs using NeHII reported having received training from NeHII staff. As previously discussed, one of the commonly cited reasons for not utilizing health information tools was a lack of relevant data or data deemed



useful to local health departments. Again, most departments mentioned a barrier being that local hospitals and clinics were not on the NeHII system. Overall, given their experiences with NeHII, a majority of local health departments felt NeHII was an important, easy to use public health tool that played a positive role in their departmental decision-making.

### Recommendations:

#### Recommendation 1: Addressing Funding Issues

The lack of funding was the most frequently mentioned barrier to the use of electronic health records and health information technology, according to both NeHII employees and local health departments. Local health departments face costs of accessing data, having enough human resources to analyze and use the data, and in having department staff adequately trained in its use. Additional costs are related to having the infrastructure to handle EHRs use. To address these financial concerns, LHDs in Nebraska will need to secure assistance from local, state, and national entities. According to a report by the Robert Wood Johnson Foundation, an important source is applying for grants and awards offered by federal entities such as the Department of Health and Human Services (DHHS), Health Resources and Services Administration (HRSA), and the Centers for Disease Control and Prevention (CDC) (Robert Wood Johnson Foundation, 2009). One example is the CDC's 'State and Local Public Health Actions - 1422' grant (Centers for Disease Control and Prevention, 2015). Additional emphasis should be on the concept of economies of scale that comes from pooling resources between local health departments as well as with other community health partners.

## Recommendation 2: Utilization of NeHII

A Health Information Exchange, such as NeHII, helps facilitate the exchange of the vast and constantly increasing amounts of health information through the use of EHRs. It is imperative for local health departments to take advantage of available NeHII data tools for evaluating programs, disease surveillance, and to improve public health reporting. Given the number of rural populations served by Nebraska's local health departments, it is recommended that NALHD and LHDs work with NeHII to incorporate rural hospitals and clinics for data sharing purposes. Another recommendation for LHDs is to conduct formal assessments of their current health information technology capabilities to ensure readiness.

## Recommendation 3: Increase Awareness of EHR use for Public Health

To better utilize electronic health records data by local health departments, it is recommended to raise awareness of the types of data available through EHRs and of the current uses by local health departments in Nebraska. This can occur through the increase in communication, training, and outreach between LHDs. This helps in multiple ways. An example is that NeHII employees mentioned that LHDs have free access to NeHII and its tools, as well as recent certification as a QCDR (Qualified Clinical Data Registry). Local health departments with knowledge of this information would be able to gain free access (which addresses cost concerns) to reliable, accurate data that meets standards (which addresses data and transmission standards concerns). Local health departments that would benefit the most from increased awareness would be those that stated they did not currently use either NeHII or electronic health records data.

### Limitations:

This study has certain limitations that should be taken into consideration. Given the use of a questionnaire and interviews for data collection purposes, a limitation of this study is the possibility of recall bias or response bias. This could lead to instances of study participants unable to correctly recollect pertinent information or unable to provide accurate responses. As the questionnaires were self-administered, there was the chance that study intentions were not clearly communicated through questions or that the respondent did not fully comprehend the questions being asked.

The use of purposive sampling in the selection of interview subjects can be prone to researcher bias. This is due to the dependence on the researcher's subjective judgment in identifying knowledgeable persons for data collection. Researcher bias is mitigated with careful selection criteria of interview participants.

Another limitation to note in this study is the small sample size of interview participants. Data collected may not be generalized to other local health departments, given possible diversities in populations served and resources available. Responses collected are meant to be individualized, however, in order to serve as examples of current situations faced by Nebraska local health departments regarding the use of electronic health records data.

## **Conclusion**

Advancements in health information technology aim to help in the collection, analysis, and sharing of health data that is essential for improving public and population health. Electronic health records are an important health informatics tool that provides health information data that can assist local health departments.

The goal of this research project was to assess the current practices of Nebraska's local health departments in using electronic health records data to address public health issues in the state. Through this study, it was determined that a majority of local health departments in Nebraska currently implement the use of EHR data as a part of their workflow. The data from electronic health records help the LHDs set priorities, improve health services, monitor disease trends and outbreaks, identify community health needs, and develop health strategies. Based on the results of this study, local health departments tend to use a multitude of data sources, such as NeHII, for their activities. NeHII is an important center of health information in Nebraska for those in the healthcare sector and it is recommended that LHDs use this source. The use of multiple sources of data also highlighted a critical need extensively discussed by study participants; that of real-time, accurate, localized health data. This is an area where electronic health records data can have a positive impact on public health programs and interventions. However, barriers such as high associated costs and a lack of resources have led to the under-utilization of EHRs by many local health departments. These barriers have prevented some local departments from using EHRs and steps must be taken to alleviate them. To achieve the goal of improving health outcomes in Nebraska,

there must be a greater focus on the implementation of electronic health records data for all local health departments.

## References

- Centers for Disease Control and Prevention. (2011). Core functions of public health and how they relate to the 10 essential services. Retrieved from [https://www.cdc.gov/nceh/ehs/ephli/core\\_ess.htm](https://www.cdc.gov/nceh/ehs/ephli/core_ess.htm)
- Centers for Disease Control and Prevention. (2015). State and local public health actions - 1422. Retrieved from <https://www.cdc.gov/chronicdisease/about/foa/2014foa/public-health-action.htm>
- County Health Rankings. (2017). 2017 county health rankings - nebraska. Retrieved from <http://www.countyhealthrankings.org/rankings/data/ne>
- Foldy, S., Grannis, S., Ross, D., & Smith, T. (2014). A ride in the time machine: Information management capabilities health departments will need. *American Journal of Public Health*, 104(9), 1592-1600.
- Friedman, D. J., Parrish, R. G., & Ross, D. A. (2013). Electronic health records and US public health: Current realities and future promise. *American Journal of Public Health*, 103(9), 1560-1567.
- Institute for Healthcare Improvement. (2017). The IHI triple aim. Retrieved from <http://www.ihl.org/Engage/Initiatives/TripleAim/Pages/default.aspx>
- Kukafka, R., Ancker, J. S., Chan, C., Chelico, J., Khan, S., Mortoti, S., . . . Stephens, K. (2007). Redesigning electronic health record systems to support public health. *Journal of Biomedical Informatics*, 40(4), 398-409.
- McCullough, J. M., & Goodin, K. (2016). Clinical data systems to support public health practice: A national survey of software and storage systems among local health departments.

*Journal of Public Health Management and Practice : JPHMP*, 22 Suppl 6, *Public Health Informatics*, S18-S26. doi:10.1097/PHH.0000000000000443 [doi]

Menachemi, N., & Collum, T. H. (2011). Benefits and drawbacks of electronic health record systems. *Risk Management and Healthcare Policy*, 4, 47-55. doi:10.2147/RMHP.S12985 [doi]

Mental Health America. (2017). Ranking the states. Retrieved from <http://www.mentalhealthamerica.net/issues/ranking-states>

NALHD. (2017). Nebraska association of local health directors - about us. Retrieved from <http://nalhd.org/about-us/>

Robert Wood Johnson Foundation. (2009). County and city health departments: The need for sustainable funding through health reform. Retrieved from <http://healthyamericans.org/assets/files/Sustainable.pdf>

Shah, G. H., Luo, H., & Sotnikov, S. (2014). Public health services most commonly provided by local health departments in the united states. *Frontiers in Public Health Services and Systems Research*, 3(1), 2.

Tomines, A., Readhead, H., Readhead, A., & Teutsch, S. (2013). Applications of electronic health information in public health: Uses, opportunities & barriers. *EGEMS (Washington, DC)*, 1(2), 1019-9214.1019. eCollection 2013. doi:10.13063/2327-9214.1019 [doi]

United Health Foundation. (2017). America's health rankings 2016 annual report - NE. Retrieved from <https://www.americashealthrankings.org/explore/2016-annual-report/measure/Overall/state/NE>

Williams, K. S., & Shah, G. H. (2016). Electronic health records and meaningful use in local health departments: Updates from the 2015 NACCHO informatics assessment survey. *Journal of Public Health Management and Practice : JPHMP*, 22 Suppl 6, *Public Health Informatics*, S27-S33. doi:10.1097/PHH.0000000000000460 [doi]



### **Service Learning/Capstone Experience – Reflection**

The Nebraska Association of Local Health Directors (NALHD) is a non-profit organization that strives to amplify the work done by the state's local health departments in improving the health of the people of Nebraska. NALHD members include 19 of Nebraska's 20 local health departments, which serve 92 out of 93 counties. The health professionals at NALHD collaborate with numerous organizations and institutions to improve Nebraska's health through program initiatives and training that address issues such as education, emergency preparedness, housing, vaccinations, health literacy, and the needs of Veterans and their families.

During this SL/CE, I performed various activities for NALHD and for my Capstone project. My service learning activities included the opportunity to attend the 2017 Public Health Association of Nebraska (PHAN) Annual Conference, where I manned the NALHD booth and shared information on the organization with attendees. I also had the opportunity to attend an eHealth Council Meeting held by the Nebraska Information Technology Commission, where I learned about current and future health information technology initiatives in the state. For NALHD, I helped develop recommendations to improve their 'Network of Care' website, which is a resource for individuals, families, communities, and health departments for information on health-related services, laws, and news. NALHD conducts numerous distance and in-person trainings on a number of public health related topics. They have a database of all the training events they have held that includes health literacy webinars (e.g., health insurance, Affordable Care Act, health disparities, community health) or presentations on general public health topics, Veteran's health, and mental health. I helped by updating and organizing this database.

An important training program they conduct is 'Mental Health First Aid (MHFA)', which occurs mostly in-person at locations across the state. Attendees include local health department employees as well as other healthcare professionals, such as first responders. The purpose of MHFA is to help attendees gain a better understanding of mental health conditions in people. I entered MHFA-related data, such as evaluation responses and demographics, into existing surveys and into a survey I created. I also assisted NALHD on a grant application by conducting a literature review of relevant information.

Activities performed for my SL/CE also included meetings with committee or NALHD members to develop and carry out the Capstone project. Their expertise and input was crucial to the project's success since I was primarily responsible for creating a survey questionnaire that was administered to Nebraska's local health departments, with help from NALHD. I was also responsible for developing the interview questions and then conducting interviews with selected local health directors and NeHII employees. This was a new experience for me since I had not previously conducted interviews for research purposes. From the survey questionnaire and interviews, I learned that the use of EHRs is very different among different local health departments. I also learned that each local health department faces its own unique challenges to meeting their department goals, especially regarding the use of health information technology.

Issues did arise during the project that needed to be addressed. The accelerated timeline was always a concern and there was little room for unexpected situations. An example of this was the difficulty I faced in trying to schedule interviews with selected

participants, even after having taken their busy schedules into consideration and having informed them of estimated interview lengths. I had to reschedule more than once when a participant was no longer available and I had to then adjust accordingly in response to ensure that enough participants were interviewed for the project. In the future, I must allot adequate time to schedule interviews, as well as having alternate participants ready should any initial selected participants drop out.

Throughout the SL/CE I observed and used leadership and management skills that I believe are important for public health professionals such as proper communication, collaborative decision-making, teamwork, having clearly defined roles, the delegation of tasks, and the ability to adjust to situations over which one has no control. Effective communication was extremely important for the success of a project as it kept all involved aware of the status and developments of the project. It also enabled project members to freely give their input on how to proceed with the project and was crucial for the development of the data collection processes. This reinforced my belief that one must listen to others to gain from their knowledge and experience, especially since they might be professionals who have worked extensively in that field. As a leader, it is extremely important that when working with a diverse group, all opinions are heard and valued since many organizations will similarly have diverse groups of individuals, each with their own expertise and experience, working together to further the organization's goals. This also reinforces my own leadership style in which I believe the best way for any organization or group to succeed is to have individuals from a wide variety of backgrounds who will each be able to bring their unique experiences and perspective to the organization. Another important skill for a leader is

to delegate tasks and clearly define the roles and responsibilities of organization members. It is important for people to be aware of their specific duties and to know what is expected of them so they can work together to meet project and organization goals.

From this SL/CE project, I have gained some insight on my own skills and abilities. My experiences doing literature reviews during my MPH program were helpful as I carried out work for NALHD and my Capstone project. Previous experience in conducting a research project was also extremely useful and I learned that I had more knowledge of research practices than previously thought. I also discovered that I am comfortable when conversing with others to gain information, especially in research scenarios. I also believe that my experiences in conducting interviews with healthcare leaders for advice on my own personal career was extremely valuable.

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## Appendices

### Appendix A: Survey Questionnaire



**Title of Research Study:**

*The Use of Electronic Health Records Data for Public Health: A Snapshot of Current Practices in Nebraska's Local Health Departments*

The purpose of this study is to determine the current use of health information technology (HIT) by local health departments (LHDs) in Nebraska. Questionnaires are to be completed by local health directors or by persons identified by directors as most knowledgeable of HIT use by the department. Responses will be kept confidential.

Thank you for taking part in this study to improve public health in Nebraska.



\* 1. Local Health Department

\* 2. Position Title



[For the purpose of this study, Electronic Health Records (EHRs) data is defined as Syndromic Surveillance Data, Immunization Registries, or Electronic Laboratory Reporting]

\* 3. Does your local health department currently use electronic health records data for public and population health?

- ☐ Yes  
☐ No

If No, please explain.



\* 4. If already using EHRs, please indicate year first used.

\* 5. What kind of EHRs data do you currently use? (Select all that apply)

- ☐ Syndromic Surveillance Data  
☐ Immunization Registries  
☐ Electronic Laboratory Reporting  
☐ Other

If Other, please describe.

\* 6. To what extent does your local health department rely on electronic health records data for the following?

	Always	Often	Very little	Not at all	Don't know
Health Needs Assessments (HNAs)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Strategic Planning	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Program Planning	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

\* 7. How likely are you to recommend to other LHDs, the use of electronic health records data for Health Needs Assessments, Strategic Planning, or Program Planning?

Definitely	Probably	Probably not	Not at all	Unsure
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>



\* 8. If you do not currently use EHRs data, do you plan to implement use?

- ☐ Yes
- ☐ No



\* 9. When do you plan to implement use?

- ☐ Within 6 months
- ☐ Within 7-12 months
- ☐ Within 1-2 years
- ☐ Unsure





\* 10. Please indicate concerns or barriers to the use of EHRs for Public Health. (Select all that apply)

- ☐ Lack of explicit state or federal authority for use of EHRs data
- ☐ Lack of funding needed to acquire/implement EHRs data for use
- ☐ Lack of EHRs data and transmission standards
- ☐ Lack of relevant information
- ☐ Capacity of LHD to select, adopt, implement EHRs for use (e.g., staff resources)
- ☐ Lack of technical knowledge and training
- ☐ Would interfere with current workflow
- ☐ Other (Please describe)



\* 11. Have you or other department staff received training in EHRs use?

- ☐ Yes
- ☐ No



\* 12. When was last training in EHRs use?

- ☐ Within last 6 months
- ☐ Within last 7-12 months
- ☐ Within last 1-2 years
- ☐ Unsure

Please describe how training was conducted. What topics were covered?



\* 13. Do you plan to participate in training in the future?

- ☐ Yes
- ☐ No

If No, please explain.



\* 14. When do you plan to participate?

- ☐ Within 6 months
- ☐ Within 7-12 months
- ☐ More than 1 year
- ☐ Unsure

\* 15. What is your perceived effect of EHRs data for improving public and population health?

Very useful

Somewhat useful

Not useful at all

Neutral

☐
☐
☐
☐

\* 16. Does your department utilize population health tools offered by the Nebraska Health Information Initiative (NeHII)?

☐ Yes

☐ No

\* 17. If you have used NeHII, for how long?

Years

Months

18. Please describe how NeHII is useful to you.

\* 19. Have you or other department staff received training in NeHII tools?

- ☐ Yes  
☐ No

\* 20. How often do you use NeHII?

- ☐ Nearly always (few times a week)  
☐ Often (few times a month)  
☐ Sometimes (few times a year)  
☐ Rarely (less than a few times a year)



\* 21. What are your reasons for not using NeHII? (Select all that apply)

- ☐ Not aware of NeHII  
☐ Lack of knowledge of NeHII tools  
☐ NeHII is not useful to department  
☐ NeHII is too complicated to use  
☐ Not enough resources to make use of NeHII  
☐ Other (please specify)

\* 22. Based on your experience with NeHII, please indicate the following.  
(Please select 'N/A' if no experience with NeHII)

	Strongly agree	Somewhat agree	Somewhat disagree	Do not agree	N/A
NeHII is easy to use	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Data tools positively affect decision-making	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
NeHII is part of workflow	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
NeHII is important for public health	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Satisfied with NeHII	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

23. Additional comments:

## **Appendix B: Interview Questions – Local Health Directors**

- 1) What is your position?
- 2) Could you please describe some of your responsibilities? Especially any experience regarding the use of Health Information Technology, such as EHRs?  
[For this study, Electronic Health Records (EHRs) data is defined as Syndromic Surveillance Data, Immunization Registries, or Electronic Laboratory Reporting]
- 3) Are you familiar with the use of EHRs data for public and population health?  
Please explain.
- 4) Does your LHD currently use EHRs data?
  - If no, SKIP to Question 7.
- 5) What kind of data do you use and for what purposes? (E.g., Health Needs Assessments, Strategic Planning, or Program planning? SKIP to Question 9.
- 6) Are there any other types of data that you would like to use, such as Clinical Data or Hospital Discharge Data?
- 7) Did you ever use? Why don't you use or why did you stop using?
- 8) Do you plan to implement use in the future? Please explain.
- 9) From your experience, have you faced any barriers to the use of EHRs in your department?
- 10) How do you expect LHDs to benefit from investing in the use of EHRs data?  
Have you seen any benefits to EHRs data use? Please describe.
- 11) Are you familiar with NeHII?
- 12) What types of NeHII information does your LHD utilize? How do you access it?  
How often?

13)What changes do you think would make NeHII more useful to you?

14)Any additional comments you'd like to share? Any questions?

## **Appendix C: Interview Questions – NeHII Employees**

- 1) What is your position at NeHII?
- 2) Could you please describe some of your responsibilities? Especially any experience regarding the use of Health Information Technology, such as EHRs?  
[For this study, Electronic Health Records (EHRs) data is defined as Syndromic Surveillance Data, Immunization Registries, or Electronic Laboratory Reporting]
- 3) What types of NeHII data are available for LHDs? What could be available in the future?
- 4) What is the process for LHDs to access NeHII tools?
- 5) What tools/types of information do you like most that NeHII provides? Please explain.
- 6) Do you feel LHDs in Nebraska adequately utilize the tools NeHII offers? Please explain.
- 7) What do you feel are some barriers to LHDs using NeHII?

Not aware of NeHII

Lack of knowledge of NeHII tools

NeHII is not useful to department

NeHII is too complicated to use

Not enough resources to make use of NeHII

Other (please specify)

- 8) How do you feel LHDs could better use NeHII? What are changes you think would make NeHII more useful for LHDs?



9) Do you or any of your colleagues/staff interact with LHDs regarding the use of NeHII? If so, how often? Or if not, why?

10)What are you currently doing to increase the use of NeHII tools?

11)Are you familiar with the use of EHRs data for public and population health?

Please explain.

12)How do you expect LHDs to benefit from investing in the use of EHRs data?

13)How likely are you to recommend to LHDs, the use of electronic health records data for Health Needs Assessments, Strategic Planning, or Program Planning?

Why?

14)What do you feel are some concerns or barriers to the use of EHRs for public health?

Lack of explicit state or federal authority for use of EHRs data

Lack of funding needed to acquire/implement EHRs data for use

Lack of EHRs data and transmission standards

Lack of relevant information

Capacity of LHD to select, adopt, implement EHRs for use (e.g., staff resources)

Lack of technical knowledge and training

Would interfere with current workflow

Other (Please describe)

15)Any additional comments you'd like to share? Any questions?

## Appendix D: Coding Index for Framework Analysis

Themes	Subcategories
LHDs currently using EHRs	Types of data currently used Purpose of current use Possible uses in the future
LHDs not currently using EHRs	Implementation plans
LHDs overall	Barriers to EHRs use Benefits of EHRs Training
NeHII	Use of NeHII Types of NeHII data/tools offered Types of NeHII data/tools used Process to access NeHII Utilization of NeHII by LHDs Barriers to LHDs using NeHII Making NeHII more useful