The Response to the COVID-19 Pandemic in Nebraska: Looking Back and Looking Forward

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Introduction

The COVID-19 pandemic posed the greatest public health emergency challenge in the United States and Nebraska since the 1918 influenza pandemic. The scale and complexity of the COVID-19 pandemic response has more closely resembled a catastrophic earthquake with ongoing aftershocks than a more traditional public health emergency. Limited resources (e.g., inadequate number of public health and medical professionals, shortages of medical supplies, and limited personal protective equipment (PPE) forced government officials at the federal, state, and local levels to prioritize resource allocation and push the boundaries of our existing resource capabilities (National Homeland Security Consortium, 2021).

The COVID-19 pandemic also revealed the limitations of our nation’s public health system when it is forced to respond to a major public health emergency. Many of these limitations such as a shortage of public health workers and outdated communication and electronic data collection strategies stem from sharp cutbacks in funding over the past 15 years. In a recent report, the Bipartisan Policy Center concluded that federal, state, and local public health agencies “have lacked the workforce and modern data systems to support surveillance, contact tracing, testing, guidance on mitigation measures, administration of vaccines, and clear communication that is needed to stop the spread of infectious diseases …” (Bipartisan Policy Center, 2021). DeSalvo and others argue that although health departments have been the foundation to the nation’s response to the COVID-19 pandemic, they have experienced numerous challenges such as underfunding, workforce shortages, outdated information technology, and the politicization and mistrust of the guidance provided by public health leaders (Karen DeSalvo, et al., 2021).

As of August 5, 2021, the number of COVID-19 cases in the U.S. was over 36 million resulting in over 600,000 deaths. The number of deaths slowed considerably in the spring and summer of 2021 due to the number of people who have become vaccinated. Unfortunately, the number of cases and deaths is once again rising rapidly, with individuals who are not vaccinated experiencing higher incidence of severe disease, hospitalizations, and death.

Nebraska has also experienced a relatively large number of COVID-19 cases (230,236 as of August 5, 2021) and 2,551 deaths. Most cases and deaths have occurred in metropolitan areas, but there is substantial variation across LHD jurisdictions when the number of cases is adjusted for population. Figure 1 shows the number of cases for each month of the pandemic beginning in March of 2020. This Figure indicates that there was a small surge primarily in nursing homes and meatpacking plants in April and May of 2020, followed by a major surge in the fall and winter of 2020 and 2021. Although the number of cases is still relatively low in August of 2021, Nebraska is now entering another major surge in cases and hospitalizations due to the state’s low vaccination rates, especially in many rural areas.

The vaccination rates rose rapidly during the months of January – March of 2021, but the rate of increase slowed considerably during the summer. The number of people who are fully vaccinated in the state is about 50 percent as of August 5, 2021. However, the rate is substantially higher for those aged 18 and over (63 percent) and those 65 and over (86 percent). The lower overall rate reflects hesitancy and resistance among younger age groups as well as the lack of a vaccine alternative for children younger than 12.
Figure 1: Trends in New Reported COVID-19 Cases in Nebraska, March of 2020 – August of 2021

Source: The New York Times, Downloaded from the NHA Newslink published by the Nebraska Hospital Association, August 6, 2021.

Figure 2 illustrates the differences in the vaccination rates for people who are aged 18 and over and fully vaccinated by selected LHD jurisdictions in Nebraska. This Figure shows that major differences exist for vaccination rates between rural and urban areas and the eastern and central and western parts of the state. For example, the vaccination rates for those aged 18 and over range from 24 percent in West Central and 33 percent in the Panhandle to 65 percent in Lancaster and Douglas Counties. Unfortunately, the lower vaccination rates lead to higher death rates. For example, the respective death rates in Lincoln and Scotts Bluff Counties which are the counties with the largest population in the West Central and Panhandle health jurisdictions were 227.4 and 266.7 deaths per 100,000 population as of August 31, 2021. The corresponding death rates in Lancaster and Douglas Counties were 85 and 132 deaths per 100,000 population (New York Times, 2021).
Figure 2: The percentage of COVID-19 Vaccination Rates by Selected LHDs in Nebraska for People Aged 18 and Over

Source: Centers for Disease Control and Prevention, July 22, 2021.

**Purpose**

In November of 2020, the College of Public Health at the University of Nebraska Medical Center awarded five internal grants to faculty and staff to explore various aspects of the COVID-19 pandemic. This grant project is focused mainly on the COVID-19 response from the viewpoint of local health departments (LHDs) in Nebraska. More specifically, this project aims to examine the factors that have contributed to a successful response by the local public health system and the barriers and challenges that limited the response. It will also identify the lessons learned and the changes that are needed to improve the local response in future pandemics.

**Methods**

A mixed methods approach was used to collect the data and information from LHDs. A survey was initially developed by faculty in the College of Public Health based on a review of the literature and then sent to the staff at the Nebraska Association of Local Health Directors (NALHD) for their review and comment. In June of 2021, the survey was sent via email using Survey Monkey to the directors of each of the 19 LHDs in Nebraska (see Appendix A for a copy of the survey questions). A total of 17 or 89 percent of the LHDs participated in the survey. To supplement the results of the surveys, four LHD directors were interviewed via Zoom (see Appendix B for a copy of the interview questions). The interviews were recorded and transcribed so that all information obtained could be verified. In addition to the data and information gathered from LHDs, a short four question survey was sent by the LHDs to some of their key partners such as school officials, hospitals, physician clinics, FQHCs, and local government officials (see Appendix C for a copy of the survey questions). A total of 161 partners returned the surveys although there was considerable variation between LHDs in the number of partner responses. For example, the number of responses varied from 86 to 1 and only 4 LHDs had 10 or more responses from their partners.
Survey Results: LHDs

The results of the survey with LHD directors revealed that many factors contributed to the success of the COVID-19 response by LHDs. Figure 3 shows that the survey participants believed that the most successful efforts in responding to the COVID-19 pandemic involved the following efforts:

- Developing stronger partnerships with K-12 schools (90 percent)
- Distributing the COVID-19 vaccines (90 percent)
- Expanding the number of people reached through contact tracing (90 percent)

Over 80 percent of the respondents indicated that other successful efforts included developing stronger partnerships with local hospitals (86 percent), vaccinating people against COVID-19 (86 percent), organizing and implementing the testing process (81 percent), receiving strong support from my Board of Health (81 percent), and sharing data with key partners and the public (81 percent). In contrast, LHDs noted less success building a stronger partnership with between DHHS and LHDs (67 percent), developing stronger partnerships with the county board (67 percent), and obtaining timely data on the number of cases, deaths, hospitalizations, and tests (67 percent).
The second question asked the survey respondents to identify significant partnership and capacity barriers that limited the LHDs’ COVID-19 response. Figure 4 indicates the existence of several significant barriers, including:

- A shortage of staff with the competencies and expertise to respond to the crisis (81 percent)
- The lack of funding prior to the pandemic (76 percent)
- Inconsistent guidance from DHHS (67 percent)
- Inconsistent guidance from the Governor’s office (62 percent)
- Limited authority at the local level (57 percent)
- The turnover of staff (52 percent)
- Lack of guidance from the federal government (52 percent)
- Concerns about threats against LHD leadership and staff (48 percent)

Figure 4: To what extent are the following examples significant barriers to LHDs' COVID-19 pandemic response

- The shortage of staff with the competencies and expertise to respond to the crisis.
- The lack of funding prior to the pandemic.
- Inconsistent guidance from DHHS.
- Inconsistent guidance from the Governor’s Office.
- Limited authority at the local level.
- The turnover of staff.
- Lack of guidance from the federal government.
- Local leadership undermined at the state and local level.
- Lack of accurate jurisdictional data (e.g., number of cases, deaths, hospitalizations, and tests).
- Concerns about threats against LHD leadership and staff.
- Lack of guidance from the Governor’s Office.
- Lack of guidance from DHHS.
- Inconsistent approaches to the response across LHD jurisdictions.
- Failure to follow establish pandemic plans.
- Lack of timely jurisdictional data (e.g., number of cases, deaths, hospitalizations, and tests).
- Lack of support from local government.
- Lack of support from hospitals, schools, local elected officials, and other partners.
- The lack of support from my Board of Health.
The third question asked about the barriers within the community that posed a challenge to LHDs in responding to the COVID-19 pandemic. As shown in Figure 5, the most significant barriers were:

- The politicization of the COVID-19 response (81 percent)
- Resistance to masking (81 percent)
- Misinformation about COVID-19 (71 percent)
- Resistance to other non-pharmaceutical interventions (62 percent)
- Concerns about the safety of the vaccines (62 percent)

The least significant factors were concerns about the safety of the COVID-19 tests and treatment and lack of support from local government.

**Figure 5: How did the following barriers impact the community's ability to successfully respond to the COVID-19 pandemic?**
When respondents were asked whether they thought the public’s perception of and support for local public health has improved or worsened due to COVID-19, 76 percent indicated that it had improved (see Figure 6). Another 14 percent believed there was no change and only 10 percent felt that it had worsened.

**Figure 6: Overall, do you think the public’s perception of and support for local public health has improved or worsened due to COVID-19?**

A successful response to the COVID-19 pandemic has involved several partners. Figure 7 reveals those agencies where the coordination of services improved during the COVID-19 pandemic. The most significant improvements occurred with K-12 schools (95 percent), other local health departments (81 percent), hospitals (81 percent), and long-term care, skilled nursing facilities (71 percent). Survey participants felt that only limited improvement occurred with the National Association of County and City Health Officials (10 percent), social services (14 percent), FQHCs which are only located in 7 LHD jurisdictions (24 percent), and CDC (29 percent).

**Figure 7: With which of the following agencies has the coordination of services improved during the COVID-19 pandemic?**

<table>
<thead>
<tr>
<th>Agency</th>
<th>Improvement Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>K-12 schools</td>
<td>95.24%</td>
</tr>
<tr>
<td>Other local health departments</td>
<td>80.95%</td>
</tr>
<tr>
<td>Hospitals</td>
<td>80.95%</td>
</tr>
<tr>
<td>Long-term care, skilled nursing facilities</td>
<td>71.43%</td>
</tr>
<tr>
<td>Local emergency management</td>
<td>57.14%</td>
</tr>
<tr>
<td>Pharmacies</td>
<td>52.38%</td>
</tr>
<tr>
<td>NALHD</td>
<td>52.38%</td>
</tr>
<tr>
<td>State Division of Public Health</td>
<td>47.62%</td>
</tr>
<tr>
<td>Medical doctors</td>
<td>47.62%</td>
</tr>
<tr>
<td>Local public safety (police, fire)</td>
<td>42.86%</td>
</tr>
<tr>
<td>CDC</td>
<td>28.57%</td>
</tr>
<tr>
<td>FQHCs</td>
<td>23.81%</td>
</tr>
<tr>
<td>Social services</td>
<td>14.29%</td>
</tr>
<tr>
<td>NACCHO</td>
<td>9.52%</td>
</tr>
</tbody>
</table>
Lessons Learned

There were many lessons learned from the COVID-19 pandemic that can be applied to future public health emergencies. Some of these were:

- Timely and effective communication between the state and LHDs and between LHDs and key partners is critical. At times, inconsistent messages between the state and LHDs caused confusion among the partners and the public. During the interviews, LHDs stressed the importance of communicating frequently (e.g., multiple times per week) with their partners (e.g., school officials, hospitals, physicians, long-term care facilities, and local government officials) and some held almost daily briefings that were often attended by the local media.

- Both the key partners and the public rely on the LHDs to provide up-to-date and relevant information and data on the number of cases, hospitalizations, deaths, and vaccination status. Without these data, many partners cannot make good policy decisions. For example, most school officials need to understand the trends at the county level so they can make better decisions on masks for children and in-school learning.

- An effective response to the COVID-19 pandemic and other major public health emergencies requires effective leadership at the federal level and a close working relationship between federal, state, and local public health agencies. However, the lack of federal leadership led to a “cookie cutter” approach across states, some misinformation, and delays in the distribution of personal protective equipment (PPE), testing capabilities, and capacity to conduct contact tracing.

- The COVID-19 pandemic exposed major vulnerabilities in the public health system. For example, LHDs are the drivers of the public health response, but they lacked the staff to conduct epidemiological studies and more sophisticated data analysis. When there were surges in the number of cases, staff shortages at both the local and state health agencies resulted in inadequate contact tracing.

- Another capacity issue was the inability to share data between state and LHDs using an effective and efficient information technology platform. Although a system was in place, it did not always operate effectively. Many LHDs did not have accurate information related to the actual number of COVID-19 cases and deaths for residents in their jurisdiction. For example, it has been difficult to determine the number of residents who died in other counties and the number of people who died within the LHD region but did not live within the jurisdiction. A more robust data sharing system would be able to identify all cases and deaths by LHD jurisdiction.

- Inconsistent data dashboards and risk dials led to confusion and mixed messages across the state.

- Local data and information are essential in making decisions related to PPE and testing prioritization, social distancing requirements, reopening businesses (e.g., restaurants), and mask requirements.

- LHDs gained valuable information by exchanging information and discussing issues with one another. These meetings were often convened by NALHD, at times daily, to ensure more consistent messages and brainstorming ideas to reach target audiences.

- Prior to the COVID-19 pandemic, most policymakers and the public did not understand the public health measures and evidence-based practices (e.g., quarantine, isolation, contact tracing) which have been used effectively in the past to minimize the number of cases and deaths associated with other disease outbreaks.

- During a pandemic of this magnitude, it was probably inevitable that some resistance would occur and lead to the politicization of the public health measures. However, inadequate resources made it difficult to address misinformation and false rumors.

- The stress and duration of the pandemic led to staff burnout and retention issues.
**Recommended Changes**

Survey participants were asked about the changes that are needed to improve the LHD response to COVID-19 and future pandemics. Most of the following recommendations are focused on communication strategies, building stronger data and surveillance systems, and continuing to develop and strengthen partnerships.

- Provide an increase sustainable baseline funding to strengthen the public health infrastructure that would include additional staff with expertise and competencies in the areas of epidemiology, surveillance, and communication.
- Invest in information technology and common platforms so that data can be easily shared across federal, state, and local public health departments. This common platform should be able to integrate with electronic health record systems used in hospitals and other health care organizations.
- Form a task force that includes state and LHD representatives to design a data dashboard and risk dials that are consistent across all LHDs. Decisions on metrics, dashboards and risk dials, and system design should be decided jointly between state and local representatives.
- Convene a group of key stakeholders, including representatives from LHDs, hospitals, physician clinics, pharmacies, and others to review the strengths and weaknesses of the current vaccine registry and develop recommendations that would lead to improvements in the functioning of the registry.
- Create a process for developing consistent messages between LHDs and communicating them to key partners and the public throughout various stages of a pandemic. Culturally appropriate messages should be developed using multiple media channels and outlets that will reach various target populations, including rural, non-English speaking, and racial and ethnic minority populations. Whenever appropriate, behavioral health experts should be used in the development of these communication messages.
- Explore the establishment of a Joint Information Center (JIC) that would have the capability of creating template messages that could be tailored by LHDs and customized to local audiences. LHDs should explore the possibility of using NALHD to fulfill JIC roles and responsibilities.
- Identify and invest in new tools for sharing and communicating information in a timely manner. Although information sharing was generally successful between the state and LHDs and between LHDs and local partners, a joint meeting should be organized with a neutral facilitator such as the College of Public Health to discuss and clarify the roles and responsibilities of LHDs and DHHS.
- Build workforce capacity within LHDs to monitor new information and communicate this information to all partners in a timely and culturally appropriate way. Use trusted voices to convey the messages to their constituents.
- Identify an outside entity that can help LHDs develop resilience strategies (e.g., flexible work schedules and self-care programs) to address staff burnout. If needed, ensure that staff have access to behavioral health services and peer-support programs.

**Interview Results: LHDs**

Four LHD directors were interviewed to supplement the results of the survey. The interviews were conducted via Zoom, recorded, and transcribed. The responses by the interview participants were summarized according to the categories of success areas, barriers and challenges, and lessons learned.
**Success Areas**

Although there was a steep learning curve in the initial stages of the COVID-19 pandemic, most felt their overall response was successful. They identified several successful areas, including their data dashboards, their work and frequent communication with partners, PPE and vaccine distribution which often involved travelling thousands of miles in large jurisdictions, and contact tracing. One of the advantages of using local contact tracers is that they can follow up with a COVID-19 patient more often and let them know about what treatments are available. One LHD director indicated that their contact tracers would contact patients daily if a patient had a serious problem.

All interview participants indicated that most partners were supportive, and their partners were “paramount to their success”. It is also important to understand the positions of their partners relative to the beliefs and actions taking place in their community. All partners want and need up-to-date data and information, and they relied heavily on the data dashboards provided by LHDs. Until the emergency declaration was rescinded by the Governor on June 30, 2021, the dashboards contained information on the number of cases, hospitalizations, deaths, and vaccination levels at the county level. In addition, frequent or sometimes daily briefings were held either with partners individually or on a community-wide basis where members of the media often attended. The dashboards and briefings helped to establish “a level of trust and relevance” between the LHD and their partners.

When the interviewees were asked about new partnerships, most replied that there were not “new” partnerships, but the relationships with previous partners were significantly strengthened, particularly with all K-12 schools, businesses, city and county officials, local chambers of commerce, and groups representing racial and ethnic minority populations.

**Barriers and Challenges**

The barriers and challenges reflected those in the survey results. As previously noted, one of the major concerns when the surge of COVID-19 cases occurred during the late summer of 2021 was the lack of data at the county level. Without this information, it became difficult for LHDs and their partners to make decisions about when and which mitigation measures (e.g., masks and social distancing) should be implemented.

Another barrier was related to the flawed data platforms that were developed for the purpose of sharing data between DHHS and LHDs. These deficiencies led to errors and inconsistencies in data reporting.

A third barrier was directly related to the limited baseline infrastructure and major resource gaps that were prevalent prior to the COVID-19 pandemic. As a result, LHDs did not have an adequate number of staff nor staff that had expertise and competencies in epidemiology and media/communication. Even when more resources became available, they did not have an adequate number of contact tracers during the surges in the winter of 2020 and 2021.

Despite having dedicated and committed core staff, some of these staff experienced burnout from the stress of the pandemic and the long hours of work. One LHD director mentioned that most staff are exhausted, and “…we need to take better care of ourselves.” One of the major contributing factors is the polarization and the spread of misinformation within communities. As a result, LHDs are spending a considerable amount of time...
addressing misinformation as well as providing support to partners who were attempting to comply with evidence-based public health practices.

Although many new staff were eventually hired to provide contact tracing during the pandemic, the onboarding process was time-consuming, and some of these staff did not stay long. One LHD director also commented that supply chain problems made it difficult to purchase computers in a timely manner which made the onboarding process even slower. Also, many of the best contact tracers were skilled interviewers but were less skilled at entering data into online systems.

Another barrier was the inconsistent communication and changing guidance from state health officials on the implementation of the directed health measures. This was a major issue, particularly in the early stages of the pandemic because in some areas the caseloads were increasing rapidly and various partners such as schools, nursing homes, hospitals, and some businesses were asking for stricter measures to be put in place.

Finally, there is some concern that the funding resources for the pandemic that were available to LHDs in the past may be more limited in the future. For example, some funding has been allocated to support contact tracing, but it does not appear that these funds will be sufficient to hire enough people to meet a major surge in new cases. Instead of receiving funds from state government, LHDs have been asked to contact local government officials for funds. Although some LHDs are likely to receive funds from local governments, others may not, resulting in an inconsistent response to the summer/fall 2021 surge.

**Lessons Learned**

The interview respondents discussed several lessons learned, including:

- Prior to the COVID-19 pandemic, they felt that the public health system in Nebraska was not ready to respond to a major pandemic. As a result, it is critical to assess the current gaps in the system and build a stronger public health infrastructure that will be better prepared to respond to future pandemics. At a minimum, LHDs need a higher level of baseline funding that is adequate to develop their epidemiology and communications capacity. Flexible reserve funds are also needed to allow LHDs to add new employees quickly. For example, contact tracing is an effective tool to help control infectious disease outbreaks. However, its effectiveness depends on how fast contacts are traced (i.e., 2 to 3 days) and quarantined. Without adequate capacity, it has been difficult to control the surges. In addition, more funds should be invested in data sharing platforms between DHHS and LHDs as well as upgrading the National Electronic Disease Surveillance System (NEDSS) which is the immunization registry used in Nebraska.

- During a pandemic, LHDs must be nimble and creative. One LHD began using community health workers to work with racial and ethnic minority populations and other underserved populations. Another LHD began using mobile clinics to provide vaccinations to hard-to-reach groups.

- One of the keys to success is to communicate frequently with all partners and the public using a variety of methods.

- To retain staff, it is important to have flexible work schedules and adopt new incentives such as employee bonuses.

- An effective response to the COVID-19 pandemic requires good coordination and collaboration between DHHS and LHDs. It would be helpful if representatives of both came together to discuss a common vision, determine clear roles and responsibilities (e.g., what activities and decisions should be made at the local level versus the state level), and develop performance criteria to assess performance.

- During a pandemic, LHDs work closely with local partners and are forced to make many decisions quickly with no or limited guidance from federal and state agencies. Whenever possible, these decisions
are based on evidence-based public health practices, but sometimes they are controversial and not everyone will agree with them. Over time, LHDs have learned to accept some risk and gained confidence through the decision-making process.

Survey Results: LHD Partners

To gain some perspective from local partners such as K-12 schools, health care providers, local elected officials, a short survey which was developed by the COPH and NALHD was sent by LHDs to their selected partners. A total of 10 LHDs sent the surveys, resulting in considerable variation in responses (i.e., 86 to 1) and only 4 LHDs had 10 or more responses. Although there is likely some bias since the LHDs selected the partners, the aggregated response from the 161 survey participants should provide a snapshot of their perceptions about the response of the LHD to the COVID-19 pandemic in their community.

The first question asked the partner’s perspective about how well the LHD responded to the pandemic. A large majority of the survey participants (82 percent) felt that their LHD responded above average and only 3 percent indicated that the response was below average (see Figure 8).

Figure 8: From your perspective, how well has your LHD responded to the COVID-19 pandemic in your area? (n = 160)

<table>
<thead>
<tr>
<th>Above Average %</th>
<th>Average %</th>
<th>Below Average %</th>
</tr>
</thead>
<tbody>
<tr>
<td>82%</td>
<td>16%</td>
<td>3%</td>
</tr>
</tbody>
</table>

LHD partners were then asked to assess how well LHDs performed specific activities. Figure 9 reveals that 89 percent of the respondents felt that LHDs were above average in regularly communicating information on the number of cases, deaths, hospitalizations, and tests, and 88 percent indicated that LHDs were above average in distributing and allocating the COVID-19 vaccines. LHDs were also above average in communicating public health messages on maintaining social distancing, limiting gatherings, and wearing masks (all at 86 percent).
Figure 9: How well has your LHD performed the following COVID-19 response activities? (n=161)

<table>
<thead>
<tr>
<th>Activity</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Regularly communicating information on the number of cases, deaths,</td>
<td>89%</td>
</tr>
<tr>
<td>hospitalizations, and tests.</td>
<td></td>
</tr>
<tr>
<td>Distributing and allocating the COVID-19 vaccines.</td>
<td>88%</td>
</tr>
<tr>
<td>Communicating public health messages on maintaining social distancing.</td>
<td>86%</td>
</tr>
<tr>
<td>Communicating public health messages on limiting gatherings.</td>
<td>86%</td>
</tr>
<tr>
<td>Communicating public health messages on wearing masks.</td>
<td>86%</td>
</tr>
<tr>
<td>Vaccinating people against COVID-19.</td>
<td>84%</td>
</tr>
<tr>
<td>Building strong partnerships with local health care providers.</td>
<td>80%</td>
</tr>
<tr>
<td>Organizing and implementing the testing process.</td>
<td>78%</td>
</tr>
<tr>
<td>Building strong partnerships with local public officials.</td>
<td>77%</td>
</tr>
</tbody>
</table>
The partners were asked to identify the most significant barriers or challenges that LHDs faced in controlling COVID-19. Figure 10 shows that the most significant barriers identified by the partners were the politicization of the COVID-19 response (66 percent), inconsistent messages between federal, state, and local officials (63 percent), resistance to masking (59 percent), and the hesitancy of many people to get vaccinated (55 percent).

**Figure 10: What were the most significant barriers or challenges for LHDs in controlling COVID-19? (n=157)**

<table>
<thead>
<tr>
<th>Challenge</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>The politicization of the COVID response</td>
<td>66.24%</td>
</tr>
<tr>
<td>Inconsistent messages between federal, state, and local officials</td>
<td>63.06%</td>
</tr>
<tr>
<td>Resistance to masking</td>
<td>59.24%</td>
</tr>
<tr>
<td>The hesitancy of many people to get vaccinated</td>
<td>54.78%</td>
</tr>
<tr>
<td>Misinformation about Covid 19</td>
<td>40.13%</td>
</tr>
<tr>
<td>The lack of support from the public</td>
<td>26.75%</td>
</tr>
<tr>
<td>The limited capacity (e.g., staffing) of the local public health department</td>
<td>26.11%</td>
</tr>
<tr>
<td>Resistance to other non-pharmaceutical interventions</td>
<td>17.83%</td>
</tr>
<tr>
<td>The lack of support from local elected public officials</td>
<td>16.56%</td>
</tr>
<tr>
<td>Limited access to COVID 19 testing</td>
<td>15.29%</td>
</tr>
<tr>
<td>Ineffective communication at the local level about COVID 19</td>
<td>10.19%</td>
</tr>
<tr>
<td>Poor planning for distributing the COVID 19 vaccines</td>
<td>7.01%</td>
</tr>
<tr>
<td>Weak partnerships with local health care providers</td>
<td>4.46%</td>
</tr>
</tbody>
</table>

The final question asked the survey participants whether LHDs need more authority to make decisions at the local level. Figure 11 illustrates that less than 50 percent of the respondents felt that LHDs needed more authority, 29 percent neither agreed or disagreed, and 24 percent disagreed.
**Covid-19 Workforce Capabilities**

To identify the most important workforce capabilities during the COVID-19 pandemic Jennifer Steventon surveyed LHDs in Nebraska in June of 2021. The purpose of the survey was to determine how LHDs valued and demonstrated the skills associated with the foundational competencies developed by the Council on Education for Public Health during the COVID-19 pandemic response. This online self-assessment survey was open to all LHDs in Nebraska, and a total of 7 LHDs (5 rural and 2 urban) completed the survey (Jennifer Steventon, 2021).

Figures 12 and 13 shows the how the respondents rated the importance of the foundational capabilities and the effectiveness of staff in demonstrating these behaviors during the COVID-19 pandemic response. Survey respondents rated each foundational competency using the following scale: (1) Not important at all, (2) Slightly important, or (3) Very important and then assessed how effective their staff demonstrated the foundational competencies using the following criteria: (Very ineffective (did not demonstrate). (2) slightly effective (demonstrated 6-10 times), or (3) Very effective (demonstrated weekly or more often) [Jennifer Steventon, 2021].

According to the survey participants, the most important foundational capabilities and demonstrated staff skills during the COVID-19 pandemic response were:

- Assess population needs, assets, and capacities that affect the communities’ health
- Apply epidemiological methods to the breadth of settings
- Advocate for political, social, or economic policies and programs
- Apply awareness of cultural values and practices
- Apply principles of leadership, governance, and management

In terms of the relationship between the effectiveness of the foundational competencies and the very important skills related to the COVID-19 pandemic response, staff were “highly effective” in the following two areas: (1) Apply systems thinking tools to a public health issue and (2) Propose strategies to identify stakeholders and build coalitions. Staff were rated as “effective” in the following competencies: (1) Apply epidemiological methods to the breadth of settings, (2) Advocate for political, social, or economic policies and programs that will improve the health of diverse populations, and (3) Apply principles of leadership, governance, and management.

There were also some areas where staff competencies were either considered “very ineffective” or “slightly ineffective” as compared to the foundational competencies. The “very ineffective” skills were: (1) Compare the
organization, structure, and function of health care, public health, and regulatory systems across national and international settings and (2) Select methods to evaluate public health programs. The following two areas were rated as “slightly effective” in the foundational competencies: (1) Assess population needs, assets, and capacities that affect communities’ health and (2) Apply awareness of cultural values and practices to the design or implementation of public health policies and programs.

The results of this study were consistent with another recent study that examined the most important domains and skills needed in LHDs to respond to large public health issues and challenges impacting their communities. This other study used a modified version of the core competencies from the Council on Linkages between Academia and Public Health Practice. Researchers identified 28 skills as the most important, and these skills were then categorized into the following four domains: (1) Data evaluation and quality improvement, (2) community engagement and facilitation, (3) Systems thinking and leadership, and (4) policy and advocacy (Brandon Grimm, et al., 2021).
Figure 12: Importance of Skills in the Foundational Competencies During the COVID-19 Pandemic Response

- Apply systems thinking tools to a public health issue
- Propose strategies to identify stakeholders and build coalitions
- Apply epidemiological methods to the breadth of settings
- Perform effectively on interprofessional teams
- Describe the importance of cultural competence in communicating
- Communicate audience-appropriate public health content
- Select communication strategies for different audiences and sectors
- Apply negotiation and mediation skills
- Apply principles of leadership, governance and management
- Advocate for political, social or economic policies and programs
- Interpret results of data analysis for public health research, policy or practice
- Select quantitative and qualitative data collection methods
- Discuss multiple dimensions of the policy-making process
- Design a population-based policy, program, project or intervention
- Apply awareness of cultural values and practices
- Discuss the means by which structural bias, social inequities and racism create challenges
- Analyze quantitative and qualitative data
- Evaluate policies for their impact on public health and health equity
- Explain basic principles and tools of budget and resource management
- Assess population needs
- Select methods to evaluate public health programs
- Compare the organization across national and international settings

Lower Effectiveness | 2.2 | 2.3 | 2.4 | 2.5 | 2.6 | 2.7 | 2.8 | 2.9 | 3
Higher Effectiveness
Figure 13: Effectiveness of Staff Demonstrating Behaviors linked to the Foundational Competencies during the COVID-19 Pandemic Response

- Apply systems thinking tools to a public health issue
- Propose strategies to identify stakeholders and build coalitions
- Apply epidemiological methods to the breadth of settings
- Perform effectively on interprofessional teams
- Describe the importance of cultural competence in communicating
- Communicate audience-appropriate public health content
- Select communication strategies for different audiences and sectors
- Apply negotiation and mediation skills
- Apply principles of leadership, governance and management
- Advocate for political, social or economic policies and programs
- Interpret results of data analysis for public health research, policy or practice
- Select quantitative and qualitative data collection methods
- Discuss multiple dimensions of the policy-making process
- Design a population-based policy, program, project or intervention
- Apply awareness of cultural values and practices
- Discuss the means by which structural bias, social inequities and racism create challenges
- Analyze quantitative and qualitative data
- Evaluate policies for their impact on public health and health equity
- Explain basic principles and tools of budget and resource management
- Assess population needs
- Select methods to evaluate public health programs
- Compare the organization across national and international settings
Discussion

This study examined the COVID-19 response primarily from the perspective of LHD directors in Nebraska. Most LHD directors felt their overall response was very effective, particularly in view of the inadequate staffing, limited analytic data capabilities and outdated information technology, and inconsistent messaging between federal, state, and local public health officials. Some of the most successful areas were building strong partnerships (e.g., K-12 schools and local hospitals), distributing and vaccinating people, contact tracing efforts, and sharing data (e.g., number of cases, tests, hospitalizations, and deaths). Many of these successes have also been identified by others. For example, Hawkins, et al. have noted that public health officials across the U.S. have regularly communicated with the public about the state of the pandemic, communicated evolving measures to bring it under control, planned and implemented an efficient and fair vaccine distribution system, and hired and trained many new contact tracer workers (Regina Hawkins, et al., 2021).

Although many barriers and challenges were identified, including a shortage of staff with the competencies and expertise to respond to the crisis, inconsistent guidance from DHHS, the Governor’s office, and the federal government, limited funding prior to the pandemic, limited authority at the local level, and turnover of staff, many of these barriers existed in other states. Other barriers such as the politicization of the COVID-19 response, resistance of masking, misinformation about COVID-19, and concerns about the safety of the vaccines were also issues found in other states. DeSalvo et al. believe that many of the infrastructure challenges stem from persistent and widening resource gaps prior to the pandemic. The COVID-19 pandemic exposed and further exacerbated the inadequate funding, workforce shortages, outdated data systems, and politicization and mistrust of public health leaders and guidance (Karen DeSalvo, et al., 2021). Juliano and others have discussed the impact of the extremely polarized political response about personal liberty, among a small, but very vocal minority of Americans concerned about government intrusion in their personal liberties. “Not wearing a face covering has become a statement about personal liberty, despite potentially infecting others” (Chrissie Juliano, 2021).

One of the key challenges revealed by the pandemic was the inability to share data between the state and LHDs because of ineffective information technology platforms. In addition, these platforms are usually not compatible with hospital EMR data (e.g., admissions, transfers, discharges). Castrucci, et al. has referred to public health data systems as neglected, archaic, and siloed with limited accuracy (Brian Castrucci, et al., 2021). To make more accurate and timely decisions about reopening’s and mask protocols, a “data superhighway” for public health is essential (Karen DeSalvo, 2021). In Nebraska, this challenge is exacerbated by the state’s narrow interpretation of the Health Insurance Portability and Accountability Act (HIPAA) to local public health data, an interpretation that has significantly limited most rural LHDs’ ability to share local data about the number of local COVID-19 cases, hospitalizations, and deaths. The State of Nebraska has interpreted the HIPAA privacy law to mean that no data can be shared in counties that have a population of less than 20,000 people. However, most states suppress information in jurisdictions with fewer than five cases or deaths (Adeel Hassan and Lisa Waananen Jones, 2021). Under HIPAA, there are data deidentification methods that would allow information sharing for counties of all sizes (HIPAA, 2000). As DHHS currently reports other health data at a county level (i.e., disease rates and abortion rates), they are likely already using these deidentification approaches in other areas apart from COVID-19 reporting (Nebraska Department of Health and Human Services. n.d.). By utilizing these same methods for COVID-19 data, DHHS would be equipping LHDs and the general public to be more comprehensively informed in their decision-making.

From a workforce capability perspective, many rural LHD teams lack the necessary knowledge and expertise in epidemiology and data analytics. Those LHDs with these capabilities were overwhelmed by the demand for their expertise during the pandemic. While it is unlikely that every LHD in Nebraska will be able to recruit an
epidemiologist, LHDs already are accustomed to sharing technical public health capacity across local jurisdictions. It may be possible to add local epidemiological capacity across the state by taking advantage of LHDs’ partnerships with each other and with experts at institutions such as the College of Public Health. Having up-to-date data platforms and the ability to analyze the data would assure a greater likelihood of identifying new trends quickly and would lead to more consistent reporting across the state.

Finally, both the interviews and the survey revealed that significant differences in interpretations related to public health practice and to local authority complicated communication between LHDs, DHHS, and the Governor’s office. This, at times resulted in confusing messages to the public. A pandemic response requires leaders to consider not only the epidemiological science, but also the broad factors that influence health. Answers to questions such as: (1) Can we mitigate the disease spread? (2) Can we mitigate the impact on families’ incomes? and (3) Can we mitigate the impact on students’ school success? Need to be carefully considered. In many cases, LHDs were not meaningfully included in decision-making processes related to state guidance even though they were expected to implement the policies and practices that impacted Nebraskan’s lives in multiple ways. While not all parties will always agree on all issues, it is important to have clear processes in place to ensure that all appropriate experts are included in both critical decisions and related communication about this and future pandemic responses.

Although many organizations have already prepared After Action Reports that have identified the strengths and weaknesses of the response to the COVID-19 pandemic, these evaluations while extremely useful tend to be narrower in scope. Given the broad and far-reaching impact of the pandemic across both public and private sectors of the state, it is critical to organize some type of public forum, such as a legislative interim study, to identify some of the major successes, the overarching barriers and challenges, the lessons learned, and recommendations to improve the response in future pandemics. Potential topics for discussion should include the flow of data and information between public health, health care providers, and others; communication issues between DHHS and LHDs; the possible expansion of directed health measures at the local level; the effectiveness of the current vaccine registry; issues related to health equity; and the funding levels for public health. In this forum, it will be important to obtain feedback from a broad array of organizations and sectors, including LHDs, NALHD, DHHS, hospitals, physician clinics, pharmacies, schools, the COPH, and the Governor’s Office.

**Limitations of the Study**

Although this study was the first to focus on the response to the COVID-19 pandemic from the perspective of LHDs in Nebraska, it does have some limitations. First, although nearly all LHDs participated in the survey, the information relied on perceptions which may be subject to recall biases. Second, the survey was conducted in early June so the information will not reflect the most recent surge in the COVID-19 pandemic. Third, the interview data were collected from only four LHDs and may not reflect the views of all LHDs. Fourth, the partner survey was sent by LHDs to their partners, so the participant views are likely to reflect some bias. Finally, this project is a case study of Nebraska from a LHD perspective, and it may not be generalizable to other states.

**Conclusion**

From the viewpoint of LHDs in Nebraska, there were many positive aspects to the COVID-19 response, but several barriers and challenges were also identified. Many of the challenges are directly related to the infrastructure gaps (e.g., workforce shortages, cutbacks in funding, and obsolete data platforms) that existed prior to the pandemic. While some of these resource gaps will require sustained funding over an extended
period, there are some short-term problems that need immediate attention. These short-term needs include an infusion of staff to conduct contact tracing and vaccine distribution, an investment in epidemiologists and data analysts as well as new, mutually agreed-upon, information technology platforms so that data can be shared more easily between state and LHDs, and the creation of a locally governed Joint Information Center, so that LHDs can communicate consistent messages to key partners and the public throughout the state. Finally, although public health staff have been incredibly resilient throughout the pandemic, creative programs and strategies should be developed more systematically to address staff burnout.
References


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Appendix A

Survey of LHD Directors – COVID 19

1. To what extent have local public health departments been successful in responding to the COVID 19 crisis? Please rank your responses on a 5-point scale, where 1 = strongly disagree, 2 = disagree, 3 = neither disagree or agree, 4 = agree, and 5 = strongly agree.

______ Communicating public health messages on maintaining physical distancing.
______ Communicating public health messages on wearing masks.
______ Communicating public health messages on limiting gatherings.
______ Building a stronger partnership between DHHS and LHDs.
______ Developing stronger partnerships with the county board.
______ Developing stronger partnerships with local hospitals.
______ Developing stronger partnerships with physician clinics.
______ Developing stronger partnerships with long-term care facilities.
______ Developing stronger partnerships with local government officials.
______ Developing stronger partnerships with K-12 schools.
______ Organizing and implementing the testing process.
______ Obtaining timely data on the number of cases, deaths, hospitalizations, and tests.
______ Sharing these data with key partners and the public.
______ Expanding the number of people reached through contact tracing.
______ Distributing the COVID 19 vaccines.
______ Vaccinating people against COVID 19.
______ Receiving strong support from my Board of Health.
______ Other initiatives____________________________________________________
______ Any other comments on your responses_________________________________

2. What were the most significant capacity and partnership barriers related to the COVID 19 crisis? Please check the top 5 most important barriers.

______ The shortage of staff with the competencies and expertise to respond to the crisis.
______ The turnover of staff.
______ The lack of support from my Board of Health.
______ Lack of guidance from DHHS.
______ Lack of guidance from the Governor’s Office.
______ Inconsistent guidance from DHHS.
______ Inconsistent guidance from the Governor’s Office.
______ Lack of guidance from the federal government.
______ Limited authority at the local level.
______ Local leadership undermined at the state and local level.
______ Inconsistent approaches to the response across LHD jurisdictions.
______ Lack of accurate jurisdictional data (e.g., number of cases, deaths, hospitalizations, and tests).
______ Lack of timely jurisdictional data (e.g., number of cases, deaths, hospitalizations, and tests).
______ The lack of funding prior to the pandemic.
______ Lack of support from local government.
______ Lack of support from hospitals, schools, local elected officials, and other partners.
______ Failure to follow established pandemic plans.
______ Concerns about threats against LHD leadership and staff.
______ Other barriers ________________________________________________________________
______ Any comments on your responses ____________________________________________

3. What were some of the most challenging community-related barriers? Please rank your response on a 5-point scale, where 1 = strongly disagree, 2 = disagree, 3 = neither disagree or agree, 4 = agree, and 5 = strongly agree.

______ Ineffective communication about COVID-19.
______ Conflicting/unaligned messages about COVID-19
______ Misinformation about COVID-19.
______ Concerns about the safety of COVID-19 tests.
______ Concerns about the safety of COVID treatment
______ Concerns about the safety of the vaccines.
______ Limited access to COVID-19 testing.
______ Fears related to government involvement (e.g., contact tracing).
______ The stigma related to COVID-19.
______ The politicization of the COVID response.
______ Lack of support from local government.
______ Resistance to masking.
______ Resistance to other non-pharmaceutical interventions.
______ Other ________________________________________________________________

4. What changes are needed to improve the local public health response to COVID-19 and future pandemics?

___________________________________________________________________________________________
___________________________________________________________________________________________
___________________________________________________________________________________________

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5. Overall, do you think the public’s perception of and support for local public health has improved or worsened due to COVID 19?

_____ Perception and support improved significantly.
_____ Perception and support somewhat improved.
_____ No change in perception or support.
_____ Perception and support somewhat worsened.
_____ Perception and support worsened significantly.

6. In which of the following agencies has the coordination of services improved during the COVID 19 crisis? Please check all that apply.

_____ Local emergency management
_____ Local public safety (police, fire)
_____ Other local health departments
_____ NALHD
_____ FQHCs
_____ Hospitals
_____ Medical doctors
_____ Long-term care, skilled nursing facilities
_____ Pharmacies
_____ K-12 schools
_____ Social services
_____ State Division of Public Health
_____ CDC
_____ NACCHO
_____ Other ______________________________________________________

7. What are the two most important lessons learned from this pandemic?
___________________________________________________________________________________________
___________________________________________________________________________________________

8. What are one or two transformative opportunities for public health that can be actively pursued because of the COVID-19 pandemic?
___________________________________________________________________________________________
___________________________________________________________________________________________
Appendix B

Interview Questions with LHD Directors

1. Overall, how successful was your response to the COVID 19 crisis?

2. What were the specific areas that were most successful?

3. What were the most significant barriers or challenges in responding to the crisis?

4. At the start of the pandemic, what was the general level of understanding of your authority to authorize and enforce directed health measures? By you, by the public, by local policymakers

5. What were the attitudes and beliefs of the Board of Health and how have you been supported by your Board?

6. How receptive was the community to messages about masks and social distancing and other NPIs?

7. Describe new partnerships your formed or partnerships that grew significantly as part of your work on this COVID response.

8. How did your communication and collaboration with other LHDs (through NALHD and otherwise) impact the effectiveness of your response?

9. How effective was the guidance and support from DHHS? Can you describe positive and negative experiences related to this?

10. How did a multicounty (regional) LHD structure improve or hinder your response efforts?

11. What changes are needed to improve the local public health response in the future (e.g., funding, workforce readiness and capabilities, and improved collaboration with partners)?
Appendix C

Survey of Partner Organizations – COVID 19

1. Overall, how successful have local public health departments been in responding to the COVID 19 crisis in your county?

_____ Very successful
_____ Successful
_____ Neither successful nor unsuccessful
_____ Unsuccessful
_____ Very unsuccessful

2. What specific areas were most successful? Please rank your responses on a 5-point scale, where 1 = strongly disagree, 2 = disagree, 3 = neither disagree or agree, 4 = agree, and 5 = strongly agree.

_____ Communicating public health messages on maintaining social distancing.
_____ Communicating public health messages on wearing masks.
_____ Communicating public health messages on limiting gatherings.
_____ Building strong partnerships with local health care providers.
_____ Building strong partnerships with local public officials.
_____ Organizing and implementing the testing process.
_____ Regularly communicating information on the number of cases, deaths, hospitalizations, and tests.
_____ Distributing the COVID 19 vaccines.
_____ Vaccinating people against Covid 19.
_____ Other initiatives ___________________________________________________

3. What were the most significant barriers or challenges for local public health departments in controlling COVID 19? Please check all that apply.

_____ The limited capacity (e.g., staffing) of the local public health department.
_____ The lack of support from the public.
_____ The lack of support from local elected public officials.
_____ Weak partnerships with local health care providers.
_____ Ineffective communication at the local level about COVID 19.
______ Misinformation about Covid 19.
______ Limited access to COVID 19 testing.
______ Inconsistent messages between federal, state, and local officials.
______ Poor planning for distributing the COVID 19 vaccines.
______ The hesitancy of many people to get vaccinated.
______ The politicization of the COVID response.
______ Resistance to masking.
______ Resistance to other non-pharmaceutical interventions.
______ Other barriers ________________________________________________

4. Do local health departments need more authority at the local level?

_____ Yes
_____ No
_____ Not Sure