SMALL CITIES RESPONSE TO PUBLIC EMERGENCIES

PHASE II REPORT

Ismaila Odogba, Professor
Department of Geography/Geology l College of Letters and Science
University of Wisconsin-Stevens Point
2001 Fourth Avenue l Stevens Point, WI 54481
Tel: 715-346-4451 l Fax: 715-346-4788
 iodogba@uwsp.edu

Anna Haines, Director and Professor
Center for Land Use Education l College of Natural Resources
University of Wisconsin-Stevens Point
800 Reserve Street l Stevens Point, WI 54481
Tel: 715-346-2386
 ahaines@uwsp.edu

Doug Miskowiak, GIS Instructional Administrator
Geographic Information Systems Center l College of Letters and Science
University of Wisconsin-Stevens Point
2001 Fourth Avenue l Stevens Point, WI 54481
Tel: 715-346-4789 l Fax: 715-346-3372
 dmiskowi@uwsp.edu

1. Overview

Since the Covid-19 pandemic began in 2019 to June 28, 2022, over 87 million Americans have been infected and over 1 million have died (*COVID-19 Dashboard*, 2022). Furthermore, in the past month alone 3,027,100 Americans have been infected and 9,363 have died. For perspective, from 1995-2020, a period of 35 years, 1,575 Americans died from tornados and 1,721 died from flooding or flash flooding (Fernandez, 2022). Yet, prior to Covid-19, our respondents noted that pandemics notoriously ranked low as a threat in All Hazard Mitigation Plans.

Human biology may offer an explanation. Harvard psychology professor, Daniel Gilbert argues "…that humans are exquisitely adapted to respond to immediate problems, such as terrorism, but not so good at more probable, but distant dangers, like global warming." (Gilbert, 2006). The human brain evolved to respond to immediate threats but misses larger looming threats. Similarly, how humans perceive emergencies like tornados and floods in comparison to more obscure threats like future pandemics have influenced emergency planning.

Notably, the purpose of the hazard assessment, a tool to measure the probability of a threat in comparison to its impact on human life and health, seems to have failed. The tool designed to rationalize emergency tactics based on information still seems overcome by this human biological condition. Local governmental units by-and-large did not prioritize and adequately plan for pandemic health emergencies. For a health event like Covid-19, characterized as a "Marathon event," small communities were initially undertrained, understaffed, and under resourced. Health departments were initially ill-equipped in the Incident Command Structure designed to delegate authority for tactical direction and control.

Concomitantly, while emergency managers scrambled to train health department personnel in the ICS, health personnel scrambled for tactical direction for resources like PPE and trained volunteers and personnel. Local small communities were presented with multiple significant challenges but remained resilient and adaptable. Firstly, the hazard assessment planning tools did not help local governments infer an emergency strategy for a large-scale, long-lasting pandemic. Furthermore, negative politics toward the response to and misinformation about COVID-19 hampered the emergency health response and exacerbated mental stress on local health workers. Some health workers reported that they were not allowed to do their jobs to address the pandemic. Despite these challenges, emergency management personnel continued to prepare health departments for an Incident Command Structure. Health departments maintained deep relationships and partnerships with the larger community. The results of the work between local emergency management and health departments found existing resources within the community that could be adapted to address the pandemic. For example, fairground facilities were converted into mass drive-through testing and vaccine clinics. Information Technology readied small communities in virtual government, some for the first time, from the

ground up. Temporary staff, volunteers, and the National Guard filled gaps in the health service structure of small communities.

The main goal of this research is to assess the capacity/preparedness of small cities in Wisconsin (including Michigan and Minnesota) to respond to future public emergencies, in particular pandemics. There are two phases to the study.

1.1 Phase I (Prior Phase)

Phase I of the study involved a content analysis of Hazard Mitigation Plans (HMP), Community Health Improvement Plans (CHIP) and Emergency Operations Plans (EOP). In total 183 plans from 108 counties were analyzed. Some of the key findings were 1) Minnesota HMPs tend to contain mitigation strategies for public health emergencies, 2) Wisconsin HMPs did not frequently address infectious diseases like COVID 19, 3) only one EOP assessed a community's risk to infectious diseases, 4) very few of the plans addressed the top Center for Disease Control and Prevention (CDC) frequent health emergencies for their respective states, and 5) Minnesota had the highest number of health departments accredited by the Public Health Accreditation Board. In summary, the major conclusion is there is a lack of mitigation strategies tailored specifically to (large-scale) pandemics. (See Phase I Report for the full result of the content analysis).

1.2 Phase II (Current Phase)

In an increasingly globalizing world, the probability of large-scale pandemics occurring has increased. A person is more likely to now experience a COVID-19 like pandemic during their lifetime as infectious diseases now pose the highest risk impact of the next and future decades (Marani et al., 2021; World Economic Forum, 2021). Simply put, large-scale pandemics will become more likely. Early indications are that the COVID-19 crisis has been a stress test of the capacity of agencies to respond to a large-scale pandemic. Thus, there is a need to understand how public health issues are identified, the lessons learned from the COVID-19 pandemic and what are the essential resources required to address future large-scale pandemics. Phase II of the research involves a qualitative analysis of data interviews conducted with public health and emergency management personnel.

2. Methodology

Approximately 130 email messages inviting participation in the Phase II interviews were delivered to the directors/heads of emergency management and public health agencies within the states of Michigan, Minnesota, and Wisconsin. After a couple of additional emails, only nine individuals accepted the invitation to interview: six emergency management and three public health personnel. Six interviews were conducted between the months of March and mid-April. By the sixth interview, certain patterns were already noticeable from the transcribed text. An additional three interviews were then conducted in May and the responses were similar to

those of the initial six interviews. The interviews lasted between 45 to 70 minutes, were all recorded, and transcribed to text.

A Thematic Content Approach (TCA) was the basis for the qualitative analysis of the interview data. Some benefits of a TCA rather than Deductive Approach which entails having predetermined themes prior to analysis are it: 1) permits the researchers to deeply explore and become familiar with the interview data thus enabling them to weed out biases 2), identify common themes and patterns within the data, and 3) ensure that the themes are derived from the data. The overall goal of a TCA is to find common patterns across the dataset from all the interviews (Creswell, 2014; Braun et al, 2006). The main steps of this TCA included the following:

1. Exploration – All the researchers listened to the recorded interviewers and read the transcribed text of each interview at least a couple of times.

2. Identifying Themes (Patterns) – Each researcher annotated the transcripts and sought to identify themes within the dataset. It should be noted that two researchers labeled/identified themes manually whilst one researcher used the computer software (NVIVO).

3. Reviewing Themes – The researchers reviewed the themes to ensure that not only do they fit the data but that the themes generated by NVIVO analysis were identical to those generated manually. Identifiable and clear distinctions between themes were sought by the research team.

4. Phrasing Themes – The researchers rehashed and developed appropriate descriptive phrases for the themes in steps 2 and 3 above.

Three categories of questions were posed to each respondent (see Appendix A). The first category of questions is aimed at the identification of **Public Health Issues**. The researchers hoped to understand the basis for the identification of such issues and why/how certain issues are considered more salient than others.

The second category of questions pertain to the **Adequacy of Public Health Emergency Approaches**. The main goal here is to gain insight into how various agencies handled the COVID-19 pandemic and identify feasible practices or required changes to better address pandemics.

The third category of questions has to do with the preparedness **Resources for Future Pandemics**. We hoped to learn what these resources might be, where they might come from (e.g., local governmental units, Centers for Disease Control, State Department of Health, etc.) and how they might be developed and provided to address future pandemics.

3. Findings

3.1 Public Health Issues

Table 1: Themes (Identifying Public Health Issues)

QUESTION	PRIMARY THEME(S)
How does your organization identify public health issues?	Collaborations/Partnership; Mandated Requirements.
If your organization prioritizes public health issues, what criteria does your organization use?	None.
How does your organization rate/rank public health epidemics or pandemics against other public health threats?	Assessments.

3.1.1 How does your organization identify public health issues?

Collaborations/Partnerships

Overwhelmingly, most respondents indicated that the identification of health concerns is based on engagement with local and regional participants such as the Public Health Advisory Boards, Departments of Health Services, and members of the community. These were usually comprised of individuals from the county board (elected officials) and appointed officials from hospitals, nursing homes, emergency management services (EMS). To identify public health issues the collaborations/partnerships involved making decisions with the aforementioned boards, conducting community assessment surveys/studies, monitoring health trends, studying epidemiologic reports from local/regional hospitals, and engaging with the state health departments. For instance, the Wisconsin Department of Health Services and the Wisconsin Emergency Management Division were looked to for direction about identification/management of the COVID-19 pandemic. Notably, responses varied between the heads/directors of emergency management and health departments. The emergency management directors often deferred to their local health agencies for direction or focused on the vulnerability assessments whilst the directors of public health departments often referred to public health advisory boards.

Representative Quote: *"there's a variety of ways, whether that's just through studies that we've read to local initiatives that we've been a part of. A lot of different things come into play; you know partnerships with local community members."*

Mandated Requirements

The role of state statutory requirements remains evident despite the lack of a standard procedure for the identification of public health threats at the local level. A couple respondents

indicated that, to an extent, state and other mandatory requirements were the basis for identifying public health issues. This is likely linked to the distribution of resources, as assets/funds, from the state (or federal) government to local government to address mandated public health requirements. More so, as indicated by a respondent, funding influences how public health issues are conceptualized at the local level. For instance, the Minnesota Department of Health funnels both state and federal funds to its community health boards to identify and address local public health priorities.

> Representative Quote: *A lot of our stuff really is driven by the state, what gets handed down by the state" … "mandated requirements really help dictate priority."*

3.1.2 If your organization prioritizes public health issues, what criteria does your organization use?

No distinct set of criteria emerged as to how public health issues were prioritized. Responses included state statutes, the county budgeting process, critical need, a collaboration between the Health Department and county board, community needs, the demographics of the affected population, epidemiological considerations, and no formal ranking system. A couple of respondents indicated that the probability of risk and impact criteria from the vulnerability assessment in the Hazard Mitigation Plan dictated prioritization whilst some respondents mentioned state statures as the main basis for the prioritization of public health issues. However, there seems to be a general indication that immediate and impactful local public health concerns should receive the greatest priority, those concerns that risk human life.

There seems to be a disconnection between public health departments and emergency management departments on the prioritization of public health issues. The use of the "all hazards" approach to pandemic planning by emergency management departments and the Public Health Emergency Preparedness (PHEP) being the foundation to planning by human health departments is a possible cause of this detachment. Further, the complex epidemiological (and socio-economic) impacts (of public health issues such as pandemics) and their rarity means resources and qualified personnel must be an essential criterion in their prioritization. Furthermore, the complex epidemiological (and socio-economic) impacts (of public health issues such as pandemics) and their rarity means that local governmental units are pressed to reallocate scarce resources from emergencies with apparent and immediate impact on human life (e.g., tornados and floods) to mitigating the potential of an unknown future health risk.

> Representative Quote: *"we look at state statutes, what's mandated in a health department … through the budgeting process the department has to rank their programs and their board has to rank their programs so that if we were ever in a position of huge funding cuts, they already have determined what is the least important, what is the most important program ..."*

3.1.3   How does your organization rate/rank public health epidemics or pandemics against other public health threats?

<u>Assessments</u>

How counties ranked/rated pandemics against other public health issues involved the use of committees including the Local Emergency Planning Committee (LEPC) and Public Health Emergency Preparedness Committee (PHEPC) to determine the rankings or consulting the ranking/ratings in the HMP. Fundamentally, these approaches are based on vulnerability/risk assessments common with hazard mitigation planning.

Most of the respondents made mention of an assessment process, the all-hazard vulnerability analysis or risk assessment. The risk assessment was usually conducted by a committee (LEPC or PHEPC) whilst the vulnerability analysis was undertaken as part of the process of developing the HMP. The assessments are typically characterized by risk/vulnerability as a function between the probability of an event occurring and impact on human health/life. Most of the respondents agreed that natural and man-made disasters are usually ranked higher than public health issues such as pandemics. The focus of most HMPs are local disasters such as floods and tornadoes which have immediate and visible impacts relative to pandemics. Prior to COVID-19 pandemics were ranked lower as the result of 1) infrequency of occurrence (low probability), 2) inexperience in managing pandemic situations, and 3) the diffuse nature of a pandemic as compared to the distinct and concentrated nature of an event like a tornado or a flood. This is despite the higher mortality rates and greater socio-economic impacts of large-scale pandemics. However, all respondents indicated that pandemics and pandemic planning are now receiving greater attention than the pre COVID-19 era.

> Representative Quote: *"we're updating our hazard vulnerability analysis which rates the likelihood of different natural man-made disasters, the level of preparedness mitigation response recovery, how they would impact different community sectors … and create a scoring ranking and usually it's the top 10 … of those threats and obviously with the last couple of years, the threat of a pandemic or epidemic due the recency bias has gone up to kind of near the top of the list."*

3.2 Adequacy of Public Health Emergency Approaches

Table 2: Themes (Public Health Emergency Approaches)

QUESTION	PRIMARY THEME(S)
What lessons were learned from the Covid-19 pandemic?	Accept Help; Manage Workload; Cross Training; Internal Coordination; Relationships/Partnerships.
What could your organization have done differently?	Staffing; Preparation; Communication.
Were there deficiencies in the existing organizational structure and what changes would you recommend?	Organizational Positions.
What were the top three challenges in addressing the pandemic?	Staffing; Communication; Lack of Resources.
What were the top three successes in managing the pandemic?	Partnerships; Personnel; Communication; Technology.

3.2.1 **What lessons were learned from the Covid-19 pandemic?**

Accept Help
Over half of the participants identified "accepting help" as an issue. Prior to the pandemic, public health staff in general had been accustomed to working on their own without the aid or assistance of other county staff, for example. Public health staff had worked with partners on specific projects, but these were not necessarily routine and long-term. Once the pandemic started, it was difficult for public health staff to recognize the need for and accept help.

Accepting help from the non-medical community among the health division manager, nurses and other health practitioners was identified by one respondent as one of the most difficult things to overcome early on. Once the local unit became inundated with cases, contact tracing and other responsibilities, health practitioners quickly became overwhelmed with responsibility, yet had difficulty relinquishing responsibility to the non-medical community. With training, these people were able to conduct health investigations (i.e., contact tracing). Once public health staff recognized help was needed and received permission or admitted that receiving help was permissible, they were able to accept it from volunteers.

One unit relied on a volunteer network of 500 individuals nurtured by the Fire Chiefs Coalition. Volunteers were used to do everything from knitting masks when PPE was unavailable, to helping the unit roll out vaccines. One local government mentioned partnerships with neighboring counties among emergency management, public health, county administration,

8

law enforcement, hospital personnel, and tribal representatives. These partners collaborated on a weekly basis, and public health networked with state public health. Another local governmental unit mentioned partnerships related to overcoming language, cultural, and socio-economic barriers. For example, they mentioned working with the school district to send messaging about COVID-19 with the family to reach out to families with language barriers – over 50 languages are spoken in the area.

Representative Quote**:** *"the hardest part was convincing my public health division manager and the nurses to accept help from other people. And that they might need help from some non-nurses too and so when we had to hire disease investigators and contact tracers, it was really, really hard for them to think, like before we managed all the communicable disease internally, and now we're going to bring on some people who aren't nurses and they're going to have access to some information and be collecting information. And I heard that from a lot of other health departments." … "one of the biggest successes that we found was just having those extra hands to help. run those things, was a big success, I would highly encourage anybody that's in these fields, to see what sort of resources they have for volunteer help."*

Manage Workload

Another issue that many participants identified as a lesson was to manage workload to "avoid burnout of staff." Staff needed to recognize and then receive permission so that it was tolerable that not everything that needed to be done could get done in a day. While the brunt of the pandemic was on public health staff, they needed to recognize what they could and could not get done in a shift, where they could use assistance, and when they needed to engage in self-care. The situations presented to the health practitioners created an environment whereby it became impossible/impractical to complete every task – to clean their slate of tasks each day. Not completing tasks whether by number or by quality was an issue for concern and anxiety among staff.

Staff were overworked with contact-tracing, then vaccines, and communication. The available staff with the necessary training were working long hours over many days. Concerning the issue of staff burnout, in hindsight, one respondent characterized pacing for a marathon, if they had only known the pandemic would stretch into years. The mental health of personnel was a genuine problem. It might be expected that these people would be in their roles for 6-10 weeks, but they did not imagine them in these roles for months and years. People needed to be traded in and out of roles to help limit burnout, especially those placed in leadership roles.

Representative Quote: *"one thing I used often was an analogy of a kitchen with dirty dishes and we have mainly a lot of women that are very type A in our health department that don't like messes and I just said, like when we had 200 cases a day and we couldn't keep up. I said, you have to view it like there's dirty dishes in the kitchen and you're not going to do dirty dishes for 24 hours. You're going to do dirty dishes for eight hours, and you need to take an hour off and take a walk and get away and leave your phone down and get away and detach, you know from this work for an hour. And so that seven hours that you are going to work, you know you've got to be healthy, to be able to do that, and you can't. You can't burn yourself out and you're just going to chip away at those dirty dishes and you're probably going to leave dirty dishes for somebody else."*

Cross-Training
The need for staff trained in the Incident Command System and the National Incident Management System was another lesson. If staff got ill, there were not enough trained people to take their place. One person characterized the problem as an "All hands-on deck" approach being necessary to manage the pandemic. In addition, who takes the lead in an emergency, especially a public health emergency needs to be well-defined, communicated, and that leadership be trained and ready.

Representative Quotes: *"really be looking at staff training on a broader level than just public health and broader than just our Department of Health and Human Services." "… I think a huge deficiency, specifically with that staff training is training in ICS incident command structure…"*

Coordinate
Because so many staff were involved in managing the pandemic, internal coordination between public health and emergency management was critical. In most cases, this internal coordination was natural and already a standard practice, but in other cases, it was not, and these two county agencies needed to work out how to coordinate and communicate. Figuring out how this coordination can and should work prior to a crisis was recognized by participants as a lesson learned.

Representative Quote**:** *"The relationship between public health and emergency management was critical neither one could have done it without the other."*

Relationships/Partnerships
A healthy relationship/partnership between the Emergency Management Department and the Public Health Department was critical to managing the Covid-19 pandemic. Both departments had their own types of strengths and weaknesses. Public health had relationships with partners in the health community and emergency management had experience with the Incident Command System and the Emergency Operations Center. It is not the day job of public health to deal with preparedness, even if public health often does plan for preparedness. Emergency management helped public health prepare themselves for an incident command response role and get ready with an incident command structure. These partnerships were critical in learning by doing and sharing those lessons, in terms of sharing resources (PPE and more) and communicating with the public and the state. Communication is a recurring theme throughout these interviews.

Representative Quote: *"we also did as a county- or as a region- we partnered with our neighboring counties with emergency management, health, county administrators, law enforcement, and hospital personnel, and tribal representatives- what we- we called it a cooperators meeting… we all got on a virtual meeting place-…- and we talked about what's happening in your county, what's happening in my county, what's happening with the tribe, what resources do we have? So we collaborated weekly on that and then emergency management and health departments also collaborated with the state to get more information and to unify our message so that we were all saying the same thing."*

10

3.2.2 *What could your organization have done differently?*

In response to what could be done differently, the following were mentioned: staffing – both the need for full-time positions and focused positions to undertake specific duties and responsibilities; the need to be well prepare now and learn from the After-Action Reports; and having a separate communications or public relations staff person rather than an incident commander acting as the chief (public) spokesperson.

> Representative Quote**:** *"I think probably the other big change that I would push for differently in the future is we ended up having our incident commander also be our main spokesperson, to the media, so she was talking or she's in her incident command role throughout the whole event but then you know multiple times a week she's going in front of the media, whether it's a virtual zoom. update or in person or whatever, but you don't give yourself a chance to stop and let somebody else answer questions. Take that task off of you, so I think that's something in the future I'm going to make sure to try to deviate away from having our incident commander be the main spokesperson for events."*

3.2.1 *Were there deficiencies in the existing organizational structure and what changes would you recommend?*

Organizational Position (Staffing)
In terms of existing structure, many participants described where the health department and/or the emergency management department sits within county government. Several elements of these focused on staffing. An underbudgeted and short-staffed Emergency Management Department was the primary deficiency identified among respondents. In one case, Emergency Management was coupled with the emergency 911 call center. Several participants talked about not having enough staff, staff turnover, staff engagement with training and the lack thereof, and lack of trained staff - particularly no one with knowledge of diseases and epidemiology. Participants also talked about the difficulty in taking a proactive approach both to public health and emergency management in general and specifically related to the pandemic. Limited staff focused on federal and state mandated programs and grant requirements. The mandated requirements took precedent, except when the pandemic and its response became the priority. More so, the hierarchical organizational structure and position of these departments within it also influenced the response to COVID-19.

Adequate Emergency Operations Facilities was mentioned twice as a deficiency. Moreover, they reported that training with the EOC was a deficiency. At one local unit, 79 EOC meetings were held during the COVID-19 pandemic. Furthermore, the elected officials, those that create policy concerning public health, were hesitant to join in the EOC atmosphere.

> Representative Quote: *"you really set up as a plan function and logistics. [We] really didn't have people assigned to that, we just kind of fell into roles as needed, but we're now, we still don't have people either to do all those positions."*

3.2.3   What were the top three challenges in addressing the pandemic?

Staffing

Staffing topped the list of challenges among participants. The personnel required to conduct ongoing communications, contact tracing, testing clinics, vaccine clinics, among a host of other tasks quickly overwhelmed local governments. Moreover, many respondents cited the excessive length of time that the pandemic persisted.

The Incident Command Structure was necessary to help manage for the unknowns concerning the lengthy pandemic. Volunteers, partners, temporary staff, and the National Guard all played roles to help manage the gap in staffing resources for local government. Among Emergency Management Directors, training in the Incident Command Structure was an important challenge. The ICS is a highly standardized structure to effectively respond to incidents. The ICS functions to delegate authority with responsibility for tactical direction and control of resources, among other functions. Public Health required significant training to be able to fulfill these types of responsibilities.

> Representative Quote: *"So staffing definitely was a huge challenge … because of the fact that only a limited number of people were trained in advance of the pandemic, there was a lot of just in time training happening, which is great for many roles, but that's not the best for those in leadership."*

Communication

Communication was a top challenge among participants. The nature of a new virus with unknown characteristics seems to have led to what some characterize as an overreaction in mitigation measures (i.e., stay at home orders). One respondent mentioned that the stay-at-home orders created a perception that health professionals were taking jobs and livelihoods away from many citizens. The messaging and the policy concerning Covid-19 was reported as rapidly changing, hurting the credibility of the public health community. Credibility was exacerbated by the negative politics of COVID-19 and the spread of misinformation.

> Representative Quote: *"The black eye that public health was getting from shutting down schools and businesses, now they really don't trust us."*

Lack of Resources

Resource issues were identified as a challenge for many of the participants. The Personal Protective Equipment supply became a problem when a nation that mandated mask-wearing did not have an adequate supply early on to address the demand. Breaks in the supply chain (inability to acquire PPE in a timely way) exacerbated the problem. Once PPE finally did become available, local units became inundated with supply to the point where the angst shifted to lack of storage capability to expiration of unused supplies. Participants talked about a better way to order supplies, for example. Another related challenge relates to being ready to respond and having a regional response.

Representative Quote: *"they had a pandemic plan, when I arrived, it was here, and I saw it, and there were pieces of it that might have been beneficial, but it was a [in] no way geared up for this large of an event and they were thinking that they're going to hand pills in an assembly line in a pod. Now we had a pandemic, where people had to social distance, had to wear a mask, we had to get vaccines, we had to swab them. That was nothing for like what they planned for, that was not in their horizon. I don't think it was on anybody's horizon like that."*

3.2.4 What were the top three successes in managing the pandemic?

<u>Developing/Maintaining Partnerships</u>
Many respondents characterized one of their greatest successes as developing and maintaining partnerships. One respondent described a relationship developed with the local tavern league to describe methods for disease investigation. The tavern league protects the interests of tavern and bar owners and were deeply suspicious and anxious about stay-at-home orders and contact tracing. The local unit worked with the league and tavern owners to conduct contact tracing without drawing attention to individual businesses to protect them from bad publicity. Taking time to explain the parameters eased their concerns and created a partner.

More common collaborations occurred with local hospital and clinic systems, the business community, long-term care facilities (nursing homes), and schools. Partnerships were commonly part of public health emergency preparedness committees. Having these connections were described as critical to the success in managing the COVID-19 pandemic. The relationships cut down on time to develop new relationships when time was of the essence. One respondent characterized the success of their health officer as being well-connected in the community and the public, describing that "If they didn't have an answer to a problem, they knew someone who did."

Representative Quote: *"Pre-established partnerships in our area, both private and public so some of those private partners that we've worked with in the in the past for. Planning big events or whatever."*

<u>Personnel</u>
While a limited workforce was listed earlier as a challenge, the ability of the workforce to be adaptable was commonly recognized as one of the successes. While most local units had limited staff, with limited training in the ICS, the utilization of resources was characterized as adaptable and hard-working. Volunteers, flexible workforce, the National Guard were all indicated as filling in gaps in available personnel. Staff were found to be willing to step-up to put in extra hours. Some characterized 60-80 hours per week was common. One participant characterized the workforce as "Not afraid to fail." While they might not have known the answer, they were willing to find out and try new ideas. Another characterized the mobilization of many people quickly and putting them in roles where they could succeed.

13

> Representative Quote: *"...county-wide staff willingness to step up to the plate and put in extra hours and put in overtime work weekends work evenings. I know there's a lot of people that were putting in 60-80 hours a week."*

Communication

Communication was characterized by participants both as a success and challenge. One community characterized their virtual meetings as being conducted twice weekly. Any member of the community could participate in these meetings. Another respondent characterized that meeting briefings were sent out with a wide net to municipalities, clerks of villages, and 150 other organizations to inform people about what the county was doing to manage the pandemic. Communications were handled by various actors that included public health officers, public information officers, and emergency directors. At least one respondent mentioned the importance of trying to share this role among leadership to manage burnout.

> Representative Quote: *"like a zoom meeting every day in the beginning, we did it twice a week now, then we switched to once a week once things slowed down a little bit. Now we're still doing them once a month. So, we do a check in, we tell them what our local data looks like, and we go from the world level to the local level."*

Technology

Technology was also listed as a success. For example, one respondent characterized how the IT team launched a series of COVID-19 dashboards to display community and epidemiological impacts of the pandemic. One characterized the acceptance of their county to embrace a virtual, hybrid model of working from home. Their community was fortunate to have had local broadband companies pushing for a fiber-optic network, even though they were a rural county. One characterized the success of social media for keeping the public informed. Their county used Twitter, Facebook, and the county website widely during the pandemic. Finally, the importance of embracing and investing in technology to prepare for emergencies was recognized as a critical component of public health and emergency management work.

> Representative Quote: *"One thing that we did do very well was switching to either a hybrid or an all-virtual format so we did- sent a lot of our employees home to do telecommuting for those offices that could. Obviously, the sheriff's office isn't one of those agencies that can do that, you can't dispatch from home as much as we'd like to. But other offices that could were sent home to do telecommuting and our county was very good about making sure everybody had connection, had a laptop, had all of the virtual software that they needed, making sure that that telecommuting was as successful as if that person was actually in the county office. So, embracing the technology, investing in our technology, investing in policies that allow our staff to go home and work from home."*

3.3 Resources Needed for Future Pandemics

Table 3: Themes (Resources for Future Pandemics)

QUESTION	PRIMARY THEME(S)
What resources does your organization consider essential for addressing future pandemics?	Personal Protection Equipment; Clinic Venues; Personnel Investment (staffing/training); Virtual Office Infrastructure; Relationships, Communication & Information.
What information did you have that was most useful for addressing the pandemic? What information would you have wanted to address the pandemic?	Data; Changing Information; Hindsight (Wish we Knew).

3.3.1 *What resources does your organization consider essential for addressing future pandemics?*

Personal Protective Equipment

Personal Protective Equipment (PPE) emerged as an essential resource for nearly each respondent. PPE includes such resources as masks, hand-sanitizer, cleaning materials, and testing materials. Limitations in PPE were further plagued by breaks in the supply chain that supplies goods to customers from manufacturers. PPE was in high demand during the COVID-19 pandemic and simultaneously in low supply. It was notoriously difficult for communities to receive PPE as every community was competing for the same scarce supply. Additionally, once supply did become available, various respondents noted that they then became inundated with PPE, shifting the problem from scarcity to now having problems storing massive supplies and risking expiration of product. PPE supply rotation suddenly became an issue and a new responsibility for public health staff.

> Representative Quote*: "warehouse full of PPE and keeping a healthy rotation on that, so that when the time comes, if it's 20-years from now you're not trying to put on an N95 that's 20-years old. Maintaining that and keeping inventory and keeping track of that that's absolutely essential."*

Locations for Vaccine/Testing Clinics

In rural communities with limited facilities, finding suitable locations for vaccine and testing clinics became a central concern as an essential resource needed to address the pandemic. Two respondents noted limitations in their Emergency Operations Center. While not itself commonly used as a clinic, it is an essential resource used for identification of suitable locations for emergencies. One respondent noted that when the pandemic began, they believed that hospitals, clinics, and pharmacies would be sufficient for addressing the need for testing and vaccinations. When it became clear existing facilities could not address the need, other facilities that could sustain mass testing and vaccination clinics were sought.

Finding suitable facilities was conducted during the pandemic. While communities did find facilities capable of addressing the need, only one respondent noted that the process was based in data. Data included suitability factors such as populations, underserved populations, access to facilities, and others. It seems feasible that identification of suitable mass clinics could have been part of a planning process rather than conducted in real-time. Notably, one respondent noted that the process of site identification was questioned and then altered by superiors. When time was of the essence, questioning these types of decisions was characterized as ineffectual and counterproductive.

Representative Quote: *"a venue for mass vaccination or mass medication distribution as in the central resource for any future pandemic."*

Investments in Personnel/Training

Investments in staffing and staff/volunteer training emerged as a common essential resource among respondents. Firstly, like the need for and lack of available PPE, trained staff and volunteers were also in short supply when every community in the nation needed them to address the Covid-19 pandemic. This problem was then exacerbated by the vast duration of the pandemic. Among those individuals responding from the health director's role, the need for staffing and training was related to tasks like contact tracing, testing, and vaccination. Among respondents in the role of emergency manager, training concerns were related to the Incident Command Structure and the Emergency Operations Center. One respondent noted that, "Back up plans are necessary so that you have a deep bench of trained individuals." In rural communities with limited budgets, additional staff during normal times is a luxury. Planning for regular cross training is a good means to maintain the "deep bench" of individuals, so that staff from one department can step up and fill in gaps where and when necessary.

Representative Quote: "*Third, and most importantly, in my opinion, is the people, none of these moves without people. The investment in your people is vitally important and again making this a priority of how much do you value your ability to be successful in the future and that really depends on the investment, how much do you invest up front in your people." … "training on the structure and operation processes of an Emergency Operations Center for all staff."*

Virtual Office Infrastructure

The ability to conduct the work of government in a virtual/digital environment was an essential resource characterized by respondents. Even in our most rural communities interviewed, broadband infrastructure available to support a virtual office environment was not listed as a common concern. Moreover, local governments while some not initially prepared for supporting the virtual office, worked diligently to set up a working virtual office infrastructure.

Representative Quote: *"Need for rural broadband and investing in ability for staff to be virtual"*

16

Maintaining Relationships/Communications/Need for Information

A recurring theme repeated in each of the three groups of interview questions was the importance and value of community partnerships and communication. While communication was identified earlier in previous questions as both a success and a challenge, it was certainly characterized as an essential resource. Communication was identified by one respondent as necessary to address in various emergency management type plans, and to emphasize channels of communications. One characterized community outreach as an important means to build trust with the community. Notably, many respondents earlier identified that trust with the community was upset by the politicization of the pandemic as well as the changing messages concerning the pandemic. Local partner meetings and keeping those local lines of communication provided valuable information for maintaining a consistent message, reinforced with good information.

Representative Quotes: *"maintaining relationships and communication with partners in our area so something that we have started up…" … "Outreach is really important anytime you're dealing with the public."*

3.3.2 What information did you have that was most useful to address the pandemic? What information would you have wanted to address the pandemic?

Data

While information from the CDC/State Health Department were commonly considered a point of frustration, it was also considered useful for addressing the pandemic. Messaging concerning how one could protect themselves (e.g., wearing a mask or washing one's hands, how Covid spread) was considered most useful.

Local information was also identified as useful for addressing the pandemic. One local governmental unit noted that they had a local data team that looked at a series of 11 different metrics (e.g., ICU beds, pediatric beds, numbers about capacity). This information was compiled to various maps and dashboards to "take a quick look and see what's the status of our health care system – what's being overwhelmed." One local governmental unit characterized local data being used to help identify the best locations and transportation routes to testing and vaccine clinics. One local governmental unit sent out surveys to gather more information from EMS and fire departments asking them what they needed, such as PPE, that they couldn't afford to buy in excess. The survey information was also related to a map to help the local unit determine where the resources were needed, in comparison to available supplies.

Representative Quote: *"we definitely did use CDC and state guidance and then also our local we had a local data team that looked at 11 local metrics every week."*

Changing Information

While data from the CDC and DHS were considered useful during the pandemic, it was also a point of frustration for respondents. One respondent shared that they (CDC and DHS) might have slowed down the messaging to verify factual information before releasing it publicly. Moreover, the information exchange from the CDC and DHS provided an overload of information – the information kept changing.

> Representative Quote: *"Although it was the most valuable, it was also the most frustrating at the same time because as fast as you could get it out, you had to change your messaging so what we ended up doing was we created a site or website with a banner across the top easy to find, easy to locate, and people were able to click that and it was our daily situation report and it was the best guess"*

Hindsight (Wish We Knew)

Various respondents addressed these questions with hindsight – thinking about what they learned about the pandemic that they wish they knew before the pandemic arose. Various respondents noted the length of the pandemic, and how they might have responded differently if they only knew they needed to invest in the pandemic for multiple years. Understanding the nature of the disease was also considered important. Covid-19 was a new virus and the CDC didn't have the best information early on about how to best fight the pandemic or how to fend off the virus. With this type of information available early on, it would have reduced the changing nature of the messaging and built trust between the health community and the citizenry.

One respondent specifically noted wanting information concerning the effects on the economy. Stay-at-home orders, local businesses being shut down, while having a positive effect of flattening the infection rate, came at a compromise to the health of local area businesses and the economy. Having information about the health of the economy in comparison to the public's physical health would be useful to determine an appropriate public policy response to the disease. With a void of economic information, the public is left to conjecture about the government's response to the Covid-19 pandemic.

> Representative Quotes: *"I wish I would have known six months before exactly what the disease was like." … "knowing how people would respond to vaccines and misinformation" … "How the pandemic was affecting the workforce (unemployment rate, restaurant/business closures)"*

4. Conclusion

The interviews we conducted in spring 2022 resulted in a rich set of qualitative data. While this type of research is not generalizable, it provided us with a much deeper understanding of what small, more rural counties/communities were dealing with over the past 2 years of the COVID pandemic.

Organizational capabilities exist in small municipalities to respond to public health emergencies, particularly natural disasters, man-made disasters, and to an extent small-scale localized epidemics barring the need for supplies such as PPEs. However, large scale pandemics pose a different set of challenges as evident by the findings of this research. Several themes kept recurring during the interviews per capacity/preparedness initiates necessary for future pandemics. The following themes should be built upon to facilitate the capacity to address future pandemics.

- Communication: Communities need a good understanding of who is communicating to the public, how communities are communicating to each other and other partners. One way to achieve better communication is to devote to a section of the plan to communication and, specifically, to different kinds of emergencies. The beginning of the pandemic tested all forms of communication.

- Funding: This is an important aspect and it's easy to say more funding is needed. What was evident in these interviews is that public health needs staff, venues, and supplies. Elected officials need to be made aware that being prepared is not a waste of funds and that there may be multiple ways in which to make sure that staff needs, venues, and supplies are identified, for example. It may be worth documenting how many temporary staff were needed, how many volunteers, how many overtime hours and translating that into dollars. In addition, identifying venues that could be needed for mass testing or vaccination sites. While these venues don't need to be constructed for a particular use, schools, stadiums, and other venues that may be needed should be aware as a partner that their sites could be needed in an emergency.

- Partners: The importance of partners were revealed in these interviews. Partners are internal to a community or county – businesses, schools, churches, etc. Partners are also external to the community or county and mostly referred to neighboring communities or counties. These external partners were able to share information, ideas, and practices.

- Plans: As communities update their various plans that address public health issues, including the "all-hazard" mitigation plan, the themes we uncovered from these interviews are important to address within plans. While all the participants recognized that plans need updating, the themes within this list are important to address.

- Staffing: There were many aspects to staffing – quantity, quality, commitment, overwork, and the clear and present danger of burning out and staff leaving. There are strategies that these participants said they had put in place and tried to address to avoid and deal with burnout. The issue of burnout needs to be discussed and addressed to avoid regular turnover in staff. It is necessary to ensure that not only is staffing adequate in times of pandemics but that there is an integrated training program for all emergency preparedness agencies both locally and regionally.

- Data: Interview respondents' concerns about data collection, data sharing, and messaging during the COVID-19 pandemic beckon for identification of common operational information needs to address pandemic emergencies. Respondents characterized data metrics that were important during the pandemic (e.g., number of infections, number of deaths, available ICU beds, etc.). While it seems that some critical data points can be provided from federal and state levels (CDC and DHS), grassroots data from local governmental units, EMTs, and health partners like hospitals and nursing homes are also critical for managing pandemic incidents. Further investigation is necessary to determine appropriate systems and resources for grassroots data collection, standardization, and aggregation, and sharing for public distribution.

An unexpected and surprising aspect to these interviews was the emotion evident in participants' voices and what they said. We wondered if these interviews were somewhat therapeutic for the participants. It seemed to us that we were giving them an opportunity to reflect and process the past two years of the pandemic, which few had the chance to do.

There is still plenty to learn from the pandemic and how small (and large) communities responded to it. We found lots of lessons that could be applied to the next pandemic, and perhaps many of these lessons can be applied to other emergencies. Getting ready and staying ready for the next emergency and pandemic will be a key challenge for many communities as other situations and daily needs fill working hours.

5. Appendices

Appendix A – Interview Questions

1 To assess how public health issues are identified/determined.
    1. How does your organization identify public health issues? (Prompt - for example trends, local or global)
    2. If your organization prioritizes public health issues, what criteria does your organization use? (Prompt – capacity (staff, funds)
    3. How does your organization rate/rank public health epidemics or pandemics against other public health threats? (Possible follow up - Why is this the most salient and do you feel the county/organization can tackle it?)

2 To determine the adequacy of existing public health emergency approaches.
    1. What lessons were learned from the Covid-19 pandemic?
    2. What could your organization have done differently?
    3. Were there deficiencies in the existing organizational structure and what changes would you recommend?
    4. Follow up questions
        2.4.1 What were the top three challenges in addressing the pandemic?
        2.4.2 What were the top three successes in managing the pandemic?

3 To Identify preparedness resources required for addressing pandemics.
    1. What resources does your organization consider essential for addressing future pandemic?
    2. What information did you have that was most useful to address the pandemic?
    3. What information would you have wanted to address the pandemic?

References

Braun, Virginia & Victoria Clarke, *Using thematic analysis in psychology,* in *Qualitative Research in Psychology*, Volume 3(2), 2006.

COVID-19 Dashboard. (2022, June 28). John Hopkins University, Coronavirus Resource Center. Retrieved June 28, 2022, from https://coronavirus.jhu.edu/map.html

Creswell, John (2014). R*esearch Design: Qualitative, Quantitative, and Mixed Methods Approaches*, 4th Edition. SAGE Publications.

Fernandez, L. (2022, June 21). *Tornadoes in the U.S. - number of fatalities 1995–2020*. Statista. https://www.statista.com/statistics/203694/number-of-fatalities-caused-by-tornadoes-in-the-us/

Fernandez, L. (2022, June 21). *Floods in the U.S. - number of fatalities 1995–2020*. Statista. https://www.statista.com/statistics/203709/number-of-fatalities-caused-by-floods-and-flash floods-in-the-us/

Gilbert, Daniel (2006). *Humans Wired to Respond to Short Term Problems*. National Public Radio. https://www.npr.org/templates/story/story.php?storyId=5530483

Marani, M., Katul, G. G., Pan, W. K. & Parolari, A.J. (Eds.). (2021, August 23). *Intensity and frequency of extreme novel epidemics* (Vol. 118, Issue 35). https://doi.org/10.1073/pnas.210548211

World Economic Forum (2021). *The Global Risk Report 2021*. (16th Edition). https://www3.weforum.org/docs/WEF_The_Global_Risks_Report_2021.pdf