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A Qualitative Study of the COVID-19 Response Experiences of Public Health Workers in the United States

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The mental health impacts of the COVID-19 pandemic on frontline, patient-facing healthcare staff have been described in several studies, but the effects of the COVID-19 response on the US public health workforce have not been well characterized. In early 2021, we conducted interviews with a subset of public health practitioners in the United States who participated in a cross-sectional survey and indicated their willingness to participate in a follow-up interview. An interview guide was developed to collect information about professional roles since the start of the pandemic, aspects of the individual COVID-19 response that impacted mental health, and aspects of the organizational/institutional COVID-19 response that impacted mental health, as well as the strengths and weaknesses of, opportunities for, and threats to public health professionals and organizations going forward. Interviews were transcribed and inductively coded to identify themes. Of the 48 people invited to participate, 24 completed an interview between January 28 and February 23, 2021. Five key themes were identified through inductive coding of interview transcripts: (1) teamwork and workplace camaraderie, (2) potential for growth in the field of public health, (3) considerations for adaptive work environments (eg, remote work, work out of jurisdiction, transition to telework), (4) politicization of response, and (5) constrained hiring capacity and burnout. After more than a year of public health emergency response to the COVID-19 pandemic, it is critically important to understand the detrimental and supportive factors of good mental health among the public health workforce.

Keywords: COVID-19, Public health preparedness/response, Epidemic management/response, Burnout, Mental health

Introduction

The COVID-19 pandemic was declared a public health emergency in the United States on January 31, 2020,[1] and since then the response to the pandemic has placed significant strain on many essential frontline professionals, including those working in healthcare and public health. A relatively large number of studies have addressed the physical and mental health impacts of the pandemic on frontline, patient-facing healthcare staff.[2-5] Rapid and systematic reviews have found that healthcare workers are at an increased risk of developing mental health conditions such as psychological distress, insomnia, anxiety, depression, and

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symptoms of posttraumatic stress disorder.[2,5] In meta-analyses, the pooled prevalence of anxiety among healthcare workers during the COVID-19 response was 25.0% to 43.0% and the prevalence of depression was 25.0%.[6] To contextualize these metrics, the US Centers for Disease Control and Prevention (CDC) Behavioral Risk Factor Surveillance System reported that 12.6% of individuals from all 50 states and the District of Columbia experienced poor physical health and 13.8% experienced poor mental health for 2 or more weeks in 2019.[7] In a study assessing time trends in generalized anxiety among US adults from 2008 to 2018, the prevalence of anxiety increased from 5.1% to 6.7%.[8] In 2021, the prevalence of any mental illness (eg, any mental, emotional, or behavioral disorder excluding development and substance use disorders) among US adults was 19.0%.[9] Over the course of the pandemic, mental health has deteriorated in the general population, and healthcare workers, already experiencing poor mental health at comparatively high rates, have faced even more pronounced negative mental health impacts.

Data related to the mental health impacts of the COVID-19 response on the public health workforce have been limited. This is partly attributable to difficulties in characterizing the public health workforce, both in terms of total workforce numbers and professions under the umbrella of public health, due to the field's diverse settings, multidisciplinary nature, and lack of worker classifications.[10-13] The objective of this study is to identify factors that have contributed to burnout and influenced mental health and wellbeing in the US public health workforce. For the purposes of this study, individuals were considered to be part of the public health workforce if they were professionally involved in the COVID-19 response. Although it has remained difficult to enumerate the public health workforce over the last decade, it is clear that the US governmental public health workforce began the response to COVID-19 with both an understaffed and underfunded workforce.[14] The National Association of County and City Health Officials estimated that US public health at large lost 20% of its workforce, or 37,000 jobs, since the financial crisis of 2008, while 62% of local health departments had flat or reduced funding.[15,16] The Association of State and Territorial Health Officials reported that overall public health spending declined by about 10% between 2010 and 2018, with federal expenditures decreasing by nearly 15% and state expenditures decreasing by over 22%.[17] Throughout the pandemic, public health workers have retired, resigned, or left the workforce due to stress, burnout, public threats, and political scapegoating, among other causes, which has further exacerbated the vast workforce shortage.[18]

Evidence related to the impacts of the COVID-19 response on the mental health of the public health workforce is limited. In a study of Chinese public health workers, including those responsible for infection prevention, control, and containment, the prevalence of depression and anxiety were 21% and 19%, respectively.[19] The study found that risk factors for poor mental health outcomes included working conditions such as working all night for more than 3 days, and concerns about being infected with COVID-19 at work. A cross-sectional survey of public health workers in the United States found a prevalence of depression (29%), anxiety (41%), and burnout (66%) and identified working more hours per week and having less job experience as potential risk factors.[20,21] A CDC survey of state, territorial, tribal, and local health departments found negative mental health conditions in 53% of respondents, with over 36% prevalence of posttraumatic stress and 32% prevalence of depression.[22] To better understand the experiences of the public health workforce, we conducted interviews with members of the US public health workforce to identify strengths, weaknesses, opportunities, and threats across the COVID-19 response that impacted their mental health and wellbeing.[23-26]

Methods

Data Collection and Study Population

As part of a larger, ongoing cross-sectional survey of the public health workforce distributed through professional networks, including the American Public Health Association's Epidemiology Section and on a closed social media group with verified training and workforce experience in public health, we identified respondents who completed the survey between August 23 and December 31, 2020, and were willing to participate in follow-up interviews.[27] We invited a stratified random sample of 48 individuals from state, local, and tribal health departments—24 from states with centralized public health governance and 24 from states with decentralized public health governance—to participate in the interview.[28]

Individuals were randomly sampled from within strata to ensure that informants were from a range of roles and geographies to optimize transferability of findings to the overall US public health workforce. The sample was stratified by governance structure, which has been shown to be associated with multiple public health emergency preparedness metrics, including the ability to rapidly deploy resources during a pandemic, the quality of pandemic plans, and the pace and extent of the implementation of COVID-19 control measures.[29-31] Invitations to participate were sent via email and interviews were conducted using Zoom videoconference technology (San Jose, CA).

Using a semistructured interview guide, we sought to address the following topics: professional role during the COVID-19 pandemic; impact of individual-level considerations on mental health; impact of organizational considerations on mental health; and strengths, weaknesses, opportunities, and threats associated with the pandemic at

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an organizational or agency level. All materials were reviewed by the University of Delaware Institutional Review Board (1641836-1) and determined to be exempt.

Data Analysis

Recordings and transcripts generated by Zoom were analyzed by a trained graduate researcher and a trained undergraduate researcher to independently identify key themes via inductive coding (ie, codes were not preidentified but emerged through the review process) using Microsoft Word. Independently identified codes were then presented and discussed. The research team reconciled differences through discussion and merging of similar codes, resulting in 5 themes.

Results

Of the 48 public health professionals invited to participate, 24 completed an interview (50.0% response rate) between January 28 and February 23, 2021. The interviewees included public health nurses, epidemiologists, programmatic staff, evaluators, case investigators, and data scientists, among other public health professionals, with cumulative work experiencing ranging from less than a year to more than 15 years. Two-thirds (n = 16, 66.6%) of participants were from Department of Health and Human Services Region 6 (Arkansas, Louisiana, New Mexico, Oklahoma, Texas) and the rest were from Region 10 (n = 4, 16.7%), Region 9 (n = 3, 12.5%), and Region 4 (n = 1, 4.2%). Responses were similar across the regions. Interviews lasted 20 minutes on average, with a range of 9 to 41 minutes. Half (n = 12, 50.0%) of the interviewees had more than 5 years of experience and a third (n = 8, 33.3%) of the interviewees had between 1 and 4 years of experience; no minimum experience was required to participate in the study. More than half (n = 15; 62.5%) of interviewees worked in states with centralized health departments, and 9 (37.5%) worked in states with decentralized health departments. Interviewee descriptors are summarized in the Table. We identified the following 5 key themes: (1) teamwork and workplace camaraderie, (2) potential for growth in the field of public health, (3) considerations for adaptive work environments (eg, remote work, work out of jurisdiction, transition to telework), (4) politicization of response, and (5) constrained hiring capacity and burnout. Each theme is described in detail next.

Table. Characteristics of Individual Respondents and Their Workplaces

Characteristics	*n (%)*
Gender	
Female	21 (87.5)
Male	3 (12.5)
Race	
White	19 (79.1)
Black	1 (4.2)
Asian	3 (12.5)
Other	1 (4.2)
Household size	
1 person	8 (33.3)
2 persons	5 (20.8)
3 persons	4 (16.7)
4 persons	6 (25.0)
6 persons	1 (4.2)
Government level	
State	17 (7.08)
Local	6 (25.0)
Other	1 (4.2)
Governance structure	
Centralized	15 (62.5)
Decentralized	9 (37.5)
HHS region[a]	
Region 4	1 (4.2)
Region 6	16 (66.6)
Region 9	3 (12.5)
Region 10	4 (16.7)
Cumulative experience, years	
Less 1	4 (16.7)
1 to 4	8 (33.3)
5 to 9	4 (16.7)
10 to 14	4 (16.7)
15+	4 (16.7)

[a]Region 4: Alabama, Florida, Georgia, Kentucky, Mississippi, North Carolina, South Carolina, Tennessee; Region 6: Arkansas, Louisiana, New Mexico, Oklahoma, Texas; Region 9: American Samoa, Arizona, California, Commonwealth of the Northern Mariana Islands, Federated States of Micronesia, Guam, Hawaii, Nevada, Republic of Palau, Republic of the Marshall Islands; Region 10: Alaska, Idaho, Oregon, Washington.
Abbreviation: HHS, Health and Human Services.

Teamwork and Workplace Camaraderie

The most common theme that emerged was the importance of teamwork and cooperation in protecting mental health during the response. Participants highlighted that the stressful work environment, long hours, and need to quickly adapt to new demands and changing guidance had forged strong working relationships between colleagues. Teams within the same departments worked well together, and some interviewees indicated that the array of expertise and levels of experience within teams created a robust support network for individual mental health and wellbeing by capitalizing on the different strengths and perspectives of colleagues.

Many interviewees referred to the phrase "building an airplane while flying it" to describe work demands throughout the course of the pandemic. This sentiment was echoed and elaborated upon by other interviewees who noted that the trying circumstances necessitated better and more efficient collaboration between workplace teams. Even amidst the uncharted territory, high demands, and long hours, cooperative workplace dynamics were a

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strength that bolstered team environments and mitigated negative mental health impacts.

> *The work environment and my colleagues have been one of the best things. You know, there is a lot of motivation, a lot of camaraderie. Just like, people are exhausted, but everyone has just been so dedicated, like it's just been unquestionable—people have just done whatever needs to be done and working in a team like that is really awesome.* (Public health clinician)

> *The pandemic has made my working relationship with so many people much closer just because we're forced to work together, we're on calls at 11 o'clock at night, that brings you closer together, and so I feel much closer and supported by my peers.* (Surveillance system manager)

Leadership was another key component of the discussion surrounding teamwork and workplace camaraderie. Interviewees frequently noted the importance of the quality of leadership in discussions about teamwork. When supervisors functioned as advocates for their staff, the work environment was generally more collaborative, less stressful, and more effective. One interviewee noted:

> *I feel like leadership took this seriously, and they have been very responsive in a lot of ways.* (Contact tracer and data analyst)

Another interviewee described the importance role of leadership in facilitating progress:

> *We've had access to the resources and the leadership support to do the things that we need to do.* (Incident commander and informatician)

These sentiments were contrasted by the experience of other interviewees:

> *When your leadership does not even advocate for you, or at least send an email just saying, "We appreciate you for the work you've done," it's very, very difficult to continue your work and feel like you're doing something that makes a difference.* (Data analyst)

Others mentioned the importance of opportunities to decompress with colleagues having the same experiences. While working in person, being around colleagues helped prevent a sense of loneliness and isolation that marked this period for many. These sentiments were well summarized:

> *In terms of not actually seeing people, I think coming to work and seeing people had really helped my mental health and then it was hard not to see people.* (Public health clinician)

Potential for Growth in the Field of Public Health

The opportunity most frequently mentioned by interviewees was the prospect for meaningful professional growth in the field of public health due to the COVID-19 pandemic response. This took on 3 dimensions: collaboration, recognition and awareness, and public perception.

Integration of efforts across public health specialties (eg, epidemiologists, nurses, evaluators) and data sharing were mentioned as successes across the interviews. Personal relationships, cultivated through shared experience and collaboration, were one of the keys to good data-sharing practices across different levels of public health entities, especially in the absence of the appropriate technological infrastructure to do so. Further, more public–private partnerships have been forged that have improved data management due to both necessity and innovative thinking throughout the course of the pandemic. These channels have enhanced public health response.

> *[Large private technology companies] are very interested in helping us, which is great. And so, we've been able to partner with them pretty effectively to do stuff on timescales that never would have been possible. I mean literally we have probably 15 years' worth of IT projects either in progress or done in the last 10 months or so.* (Incident commander and informatician)

While public health is not typically a visible component of patient-facing, frontline healthcare work, the pandemic has brought into public view the critical but sometimes controversial role of public health in infection control and emergency powers. One interviewee noted this as a potential advantage for increased funding and better community buy-in to public health efforts:

> *It is just an eye opener for the public, and I would love to think that it would result in greater respect for public health. And of course, respect should either come before the money or money should follow it—I'm not sure of the actual sequence—but that's what I really hope.* (Public health nurse)

Another interviewee agreed:

> *Honestly, I think the situation has […] opened up a lot more opportunities for public health and opened a lot of people's eyes toward how important public health is.* (Epidemiologist and contact tracer)

These sentiments reflect the hope shared by interviewees that the pandemic would garner more respect for the field of public health, improve the general understanding of public health work, and attract new professionals to the field.

Considerations for Adaptive Work Environments

Public health work environments, similar to many workplaces, have had to adapt during the COVID-19 pandemic. For some interviewees, working in person was preferable to working remotely, because it offered a sense of community and opportunities for social interaction. However, a number of interviewees saw the increased flexibility of the

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workplace as both a strength and an opportunity. One interviewee noted that remote work makes certain roles more accessible to more individuals, and another discussed the benefits of not having a long commute:

> *This was the first job I could get in a health department because they require a driver's license.* (Contact tracer and case investigator)

> *When I was working [in person] I faced a significant commute […] that had, for years, been causing me really high levels of stress, and that's gone now.* (Infectious disease epidemiologist)

Another interviewee noted how the shift to working from home allowed for more time to engage in self-care and healthy lifestyle behaviors, whereas others noted the difficulty of managing a work–life balance when working from home, especially in the beginning.

> *I have really vastly increased my exercise. In some ways, I became much healthier and less stressed. I get a full night's sleep every night, you know, so I really like it now and have adapted well to it.* (Infectious disease epidemiologist)

> *I think [working from home] was a bit more of a stressor just because that separation of work and personal life was definitely not there as much, especially being compounded with stay-at-home orders where you are kind of there all the time and just not really able to escape that.* (Program evaluator)

The shift to remote work was more well received when health departments had the ability to provide staff with the technology needed to work remotely.

> *I think basically everyone was set up to work from home within probably 10 days after the order.[…] Some people needed to get laptops or new computers or something in order to facilitate that, and they [IT] deployed 3 or 4 different technological solutions for that, so we were really fortunate.* (Surveillance and informatics epidemiologist)

Politicization of Response

Differing expectations and poor communication across varying levels of leadership was a frequently identified weakness of the public health response to COVID-19 and an important stressor for interviewees. Changing public health orders and a lack of understanding of the circumstances "in the trenches" resulted in unreasonable demands on staff.

> *The communication was beyond insufficient. There was a lot of duplication of efforts in the beginning. Really, the leadership [should have been] like, 'This is what we're doing, and you know these are all pieces,' but there was none of that.* (Case monitor and project lead)

> *I think there needs to be really clear expectations of what public health responders can get to and making sure we are not wasting our time on certain projects or doing just data collection for the point of data collection.* (Foodborne illness epidemiologist)

One interviewee noted the gaps in understanding between political and public health leaders and the public health workforce, and another noted the tensions between politics and public health:

> *They [the governor's office] are coming in with a fire hose without understanding anything about the fire.* (Case monitor and project lead)

> *I remember watching a news conference with the state epidemiologist and the governor was there. I don't think it was quite as bad as the Trump–Fauci relationship, but there were definitely things said that I'm not sure how accurate they were. You know, we are not giving our residents the complete picture. I think that's a point of frustration for me—just the idea that even some communication might be kind of hampered by political influences is frustrating to say the least.* (Program evaluator)

When there was clear communication and mutual respect between political and public health entities, there were positive effects on the public health workforce, despite facing persistent challenges with the scale and duration of the pandemic:

> *[The governor] understood, trusted experts, trusted science, and the modeling, even given the uncertainty that we had, and we got the job done. We've continued to do so. We've struggled mightily, but the struggles that we have faced, we have had good executive support and policymaker support, basically for us and the value of our work, which has helped a lot.* (Incident commander and informatician)

Constrained Hiring Capacity and Burnout

The ability to surge staff, redistribute workload, and procure needed resources quickly were key factors influencing the mental health of interviewees. Poor use of time and resources, limited time off, and significant overtime all negatively impacted the mental health of public health workers. These concerns were present before but were exacerbated by the pandemic. This sentiment was reflected by a interviewee:

> *We are understaffed, we have been understaffed before COVID[-19] but with COVID[-19] we are still understaffed, so that part has taken its toll.* (Public health nurse manager)

These concerns were in contrast to the experiences of those working in environments that were able to quickly bring on new, qualified staff to help distribute the workload. Interviewees in understaffed environments reported feeling pressure and obligation to work overtime, weekends, and holidays because they knew there were no other staff to do the job. On the other hand, the ability to hire new staff to provide surge capacity has been

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advantageous to mental health and maintenance of a work–life balance:

> *We were able to quickly increase our staff from 3 of us to, I believe we have 6 right now, so that's been a big benefit to this, and I just hope we can keep it that way.* (Chronic disease epidemiologist and contact tracer)

Burnout, fatigue, and feeling unappreciated were commonly discussed as ramifications of the high workload and limited support for personal time and mental health. The sustained duration of the pandemic without any workforce relief has taken a heavy toll on some otherwise motivated staff:

> *I think one of the things that's been really, really difficult for people is just the lack of appreciation for the people who are doing such huge amounts of work.* (Data analyst)

One interviewee noted that one of their staff had not taken a day off in over 6 months. Not having breaks makes it increasingly difficult for public health staff to separate themselves from issues. The number of hours worked in a week, with or without overtime compensation, also emerged as a significant burden on the mental health of public health staff.

> *It's 70-80 hours a week for almost a year. I think our whole team is fine with hard work, but when we are being asked to do things under unreasonable timeframes […] that is where a lot of frustration comes from.* (Surveillance systems manager)

Weaknesses, opportunities, and threats were often inextricably linked across all 5 key themes. For example, weaknesses and threats—such as lack of communication across various levels of leadership and among leaders in different agencies—were discussed in the context of negative impacts on mental health, whereas strong and deliberate communication was noted as a factor that helped staff to maintain better morale. Many opportunities were contingent upon redoubling the strengths, minimizing the threats, and addressing the weaknesses that were part of public health agency staffing and funding before the start of the pandemic. A year into the COVID-19 pandemic, interviewees unanimously agreed on the critical importance of understanding the underlying mechanisms of public health response that prove either advantageous or detrimental to supporting the maintenance of good mental health among staff as the response continues and vaccinations campaigns continue.

Discussion

The reality of negative mental health impacts in those who respond to disasters is well documented, particularly among prehospital and hospital personnel.[2,32,33] The mental health impacts of the COVID-19 response among patient-facing healthcare workers such as nurses, emergency medical technicians, physicians, and medical trainees have also been well documented.[3,34-42] However, few studies have included nonclinical staff, and the mental health impacts associated with the COVID-19 response among the public health workforce remain poorly characterized.[19] Given the substantial documentation of the psychological strain experienced by patient-facing responders and the unprecedented scale and duration of the pandemic, understanding these strains in the public health workforce is critical for supporting the workforce through the duration of the pandemic and for planning for future disasters.

Interviewees identified several factors contributing to burnout and poor mental health among the public health workforce that resonate with themes identified in prior studies of patient-facing healthcare providers. A common theme among interviewees in this study was stress and burnout associated with understaffed public health departments, with inadequate funding or personnel to manage surge capacity and workload. In clinical settings, patient–provider ratios (eg, caseloads) are similarly predictive of mental health strain.[43,44] As seen in the 2021 study of public health workers in China by Li et al,[19] increased work hours were a risk factor for poor mental health among interviewees. Working on weekends, holidays, and before and after hours to ensure that demands are met, especially during high-case periods, contributes to burnout.

Teamwork, camaraderie, and managerial support—commonly discussed as protective factors among interviewees—have been well-documented across health fields.[45,46] The Disaster Mental Health Collaborative Group identified the importance of teamwork and communication as a core competency in disaster mental health.[47] Recognizing the importance of teamwork in emergency situations, the Disaster 101: Effectiveness of Simulated Disaster Response Scenarios study sought to improve interprofessional collaboration and teamwork to better prepare trainees for real-world emergency response.[48] In a review of mental and physical health impacts of remote work, organizational support and workforce camaraderie were critical factors in contributing to successful transitions and protecting staff's mental health.[49] Accordingly, public health entities should invest in strengthening workplace culture and team dynamics to ensure these competencies are integrated into public health practice regardless of disaster or nonemergent scenarios.

Consistent and functional channels of communication—such as through the use of the incident command system (ICS)—are important for mitigating the risk of burnout and negative mental health impacts.[47] Breakdowns in communication can lead to increased workload, decreased productivity, poor use of resources, and more work-related stress. However, the use of clear organizational and communication structures like ICS can iteratively improve surge capacity, clarity of communication, and workforce wellbeing.[50] Interviewees noted that data sharing and

cooperation across departments and agencies reduced work-related stress, and these considerations are important for successful responses.[51] Early communication and coordination among stakeholders—including public health, academia, hospital systems, emergency medical services, and long-term care facilities—were key contributors to successful regional COVID-19 response in western Washington state, and interviewees reinforced the importance of communication and coordination.[51,52] Further, gaps, inconsistencies, and lack of transparency in public and workplace messaging leave staff frustrated with the apparent political influence on public health practice.[53,54] Lack of communication both within and outside of public health agencies foments burnout and significant frustration, which has led to the resignations of dozens of public health officials nationwide.[55,56]

While many factors have negatively impacted the mental health of public health professionals, the COVID-19 pandemic, as well as other public health emergencies, have also brought opportunities to strengthen the public health sector.[57-59] Following the 2003 SARS outbreak in Toronto, organizational resilience and culture, components for protecting the wellbeing of patients and personnel, were identified as key considerations for pandemic influenza preparedness planning.[33] The pandemic has forced public health professionals to move toward innovative methods for modeling, surveillance, and transmission control.[60] Beyond the functional lessons learned, interviewees in this study noted their optimism that the public health response to the COVID-19 pandemic will make the work of public health professionals more visible. This visibility could contribute to more engagement with and buy-in from the community, increased funding and partnership opportunities, and more interest in pursuing public health careers. Indeed, in the fall of 2020, applications to graduate-level public health programs increased by over 20%.[61] Similar optimism about heightened respect for, and investments in, public health agencies and their workforces was present following the 9/11 and anthrax attacks; however, gains were not maintained over the long term.

This qualitative study has several important limitations. First, the pool of potential interviewees indicated their willingness to participate in an interview while completing a cross-sectional survey related to public health workforce burnout. Therefore, response bias is possible. Another important source of potential bias in the study is the gender and racial distribution of the study participants; 87.5% (n = 21) of participants identified as female and 79.1% (n = 19) identified as White, whereas the overall US public health workforce is about 77.0% female and 57.2% White.[62] No attempt to assess causation between exposures and outcomes is made. Interviews were conducted in January and February 2021, during the presidential transition and post-holiday surge in COVID-19 cases that impacted much of the United States. Any or all of these events could have influenced responses, which may not be representative of current or prior states of the public health workforce, as both disease dynamics and policy have changed over the course of the pandemic. However, to our knowledge, this is one of the first qualitative studies to assess the factors influencing the mental health impacts of the COVID-19 response on the public health workforce, which will be critical to consider as the response to the pandemic continues in parallel with the implementation of vaccination campaigns. Larger studies and additional data are needed to more comprehensively document public health workforce wellbeing during future emergency responses.

Conclusion

It is possible to identify potential risk and protective factors for mental health impacts among the public health workforce responding to the COVID-19 pandemic. There are interdependent strengths, weaknesses, opportunities, and threats to the mental health and wellbeing of the public health workforce that are consistent with frontline healthcare workers who have been studied more extensively during the pandemic response. These qualitative findings highlight areas where action should be taken now to protect the current public health workforce and ensure the future resilience of that workforce going forward in the face of future public health disasters.

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