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Need to Amplify Health Security? Fuse Academia and Practice

Sandra I. McCoy, PhD, MPH[1]; and Pia D.M. MacDonald, PhD, MPH, CPH[2,3]

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In December 2007, we traveled to Springfield, Illinois, to engage more than 150 physicians, state and local public health officials, university officials, judges, and attorneys in a scenario exercise to prepare for a future influenza pandemic. The event was organized by the Association of State and Territorial Health Officials and the Centers for Disease Control and Prevention (CDC). It was just one of the numerous workshops and stakeholder meetings on pandemic influenza that we would facilitate and/or participate in both domestically and internationally that year as part of the University of North Carolina Center for Public Health Preparedness (UNC CPHP).

A primary mission of centers such as the UNC CPHP, which opened in 2003, was to link university faculty members and public health practitioners by bringing academic rigor to state and local health departments, adding qualified state and local public health professionals to the faculty, and influencing scholarly research and its translation to real-world action. These partnerships provided students a window into health security, thereby inspiring them to devote their careers to threats such as COVID-19 through government service.[1] The UNC CPHP was one of a network of 27 Centers for Public Health Preparedness that grew from the events after 9/11, when health emerged as a national security concern.[2] Consequently, substantial federal investment in domestic health security transformed and modernized public health, especially after passage of the Pandemic and All-Hazards Preparedness Act in 2006 mandated research to improve federal, state, local, and tribal public health preparedness and response systems.[2,3]

It would have been in the country's best interest to continue programs such as the UNC CPHP, which, among other activities, established robust systems for outbreak detection and control, as well as provided continuing education opportunities for people who are the foundation of the local response to the COVID-19 pandemic (eg, epidemiologists, infection-control practitioners, public health nurses, disease intervention specialists/contact tracers). However, beginning in the mid-2000s, investments in preparedness slowly deteriorated, and the CDC-funded program for the Centers for Public Health Preparedness and their corresponding outgrowths of 9 Preparedness and Emergency Response Research Centers (in 2008) and 14 Preparedness and Emergency Response Learning Centers (in 2010) has mostly ended,[4,5] despite recommendations by an external scientific review to continue these programs.[6,7] Likewise, in 2010, the UNC CPHP evolved into the UNC Preparedness and Emergency Response Learning Center and was subsequently closed in 2016.

This waning federal investment in health security—including divestment in formalized linkages between local and academic public health—may have contributed to delays or mishandling of the COVID-19 crisis. An October 2019 report by the US Department of Health and Human Services was only the most recent of several reports highlighting that the government was underfunded and unprepared for a pandemic.[8] Compounding this issue is that the workforce of public health professionals at the state and local level shrunk by more than 50 000 workers from 2008 to 2016.[9] In addition, a national survey in 2017 found that 22% of the public health workforce was planning to retire by 2023 and another 24% were considering leaving their organizations by 2018—a figure up 41% since 2014.[10] These factors have direct implications for the domestic response to the COVID-19 crisis. For example, at the peak of the COVID-19

[1] Division of Epidemiology and Biostatistics, School of Public Health, University of California, Berkeley, CA, USA
[2] RTI International, Research Triangle Park, NC, USA
[3] Department of Epidemiology, Gillings School of Global Public Health, University of North Carolina, Chapel Hill, NC, USA

Corresponding Author:
Sandra I. McCoy, PhD, MPH, University of California, Berkeley, School of Public Health, Division of Epidemiology and Biostatistics, 2121 Berkeley Way West, MS 7360, Berkeley, CA 94720, USA.
Email: smccoy@berkeley.edu

epidemic in Wuhan, China, 18 000 people had been mobilized locally to trace contacts in Wuhan alone.[11] In comparison, in the United States, only about 2000 people had been trained to safely conduct this work[12] *before* the COVID-19 pandemic (ie, disease intervention specialists[13] or contact tracers). Thus, without a robust and well-trained cadre of public health preparedness professionals ready to act in the early days of the US epidemic, we found ourselves outnumbered and outmaneuvered by COVID-19.

The structural relationships between academia and practice that were so robust in the early 2000s have diminished substantially, with several key consequences. The first is that insufficient planning and waning expertise in health security via a shrinking public health workforce have not been met with an adequate influx of graduates from schools and programs of public health. A 2015 survey revealed that only 39% of schools or programs of public health had a formal (written) agreement with a governmental public health agency,[14] and only about half of local health departments had a formal relationship with an academic institution.[15] Public health students today may have few avenues to explore health security through real-world experience, including meaningful, practice-based internships. It is therefore not surprising that they are increasingly likely to work at a for-profit company after graduation.[16] At the doctoral level, fewer than 1 in 5 graduates go on to work for government.[17] Exacerbating this trend is that most faculty members at a given institution may have little or no experience in the practice of applied public health. Today's student interested in health security must rely on a loose network of faculty and practice leaders who maintain research collaborations. By contrast, clinical medicine clearly does not have this problem, with its thriving system of teaching hospitals as a primary venue for the clinical education and training of medical students. Unfortunately, its counterpart system to train public health first responders is almost nonexistent in 2020.

A second consequence of the diminished structural relationship between academia and practice is that a lack of formalized partnerships has impeded the ability of schools and programs of public health to quickly backstop local and state health departments in a crisis. For example, such "surge" support might have been operationalized as early as January 2020, after the first case reports of COVID-19, by reinforcing working professionals with hundreds if not thousands of eager faculty and student volunteers, plugging in to fill key gaps in surveillance systems, informatics, data analysis, modeling, data collection, survey and questionnaire design, and health communications. Such support would also have had the benefit of infusing public health with innovative tools from academic public health (eg, machine learning, behavioral science). These bridges would be further strengthened by preexisting workforce development efforts[18] (eg, certificates in field epidemiology,[19] interactive case studies,[20] courses in disaster management[21] and communicable disease nursing,[22] technical assistance for pandemic influenza training,[23] tabletop exercises,[24] ethics discussions,[25] crisis communication trainings, and the fiscal reinforcement of programs to create student surge capacity[26] for emergencies [eg, Team-Epi Aid[27] at UNC, which closed in 2016; Cal Student Assistance for Public Health at the University of California, Berkeley; or the Student Epidemic Action Leaders[28] at the University of Washington, among others]).

Instead, some academic centers of public health may find themselves underutilized and struggling to harness the collective expertise and energy of their institutions to support frontline public health workers in response to the COVID-19 pandemic.[5,29,30] This assertion, of course, is not to minimize the outstanding contributions of individual faculty members to research on severe acute respiratory syndrome (SARS-CoV-2), the development of COVID-19 resources by academic centers, and the growth of online education necessitated by the shift to remote learning. However, public health professionals like us lament the loss of the vision we had more than a decade ago for academic schools and programs of public health to prepare a diverse and thriving workforce for the most unprecedented public health event of our lives. Organizations such as the Council on Linkages Between Academia and Public Health Practice and the Public Health Accreditation Board attempt to fill this gap by fostering collaborations between academia and public health practice and encouraging the development of a sufficient number of qualified public health workers. However, relying on the volunteer efforts of *individual* faculty and government public health officials is unsustainable; without dedicated funding for infrastructure, formalized relationships, data sharing and privacy agreements, mentorship, and leadership commitments (via academic health departments, centers, and/or deans of public health practice), it will be challenging to rebuild robust partnerships and scaffold long-term relationships.

More than 13 years ago, we had a vision for how we would respond to the pandemic of today. Structural linkages between academic schools and programs of public health and the local, state, and federal public health practice community would expose students to public health practice, thereby opening new career opportunities in health security; fostering academic research with practical, policy-relevant public health benefits; bringing technical expertise to local governments; and being readily scalable for response to urgent public health threats. We now have an opportunity to determine our nation's future response to a major health security threat, and perhaps the best place to look for a playbook lies in the past.

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ORCID iD

Sandra I. McCoy, PhD, MPH https://orcid.org/0000-0002-4764-9195

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