

Workforce readiness for community and public health doctoral students: beyond the classroom

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Abstract

COVID-19 exposed a fragile public health apparatus: nearly half of U.S. state and local health professionals departed between 2017 and 2021, and many who remained faced harassment, burnout, and politicization of their work. Against this backdrop, doctoral programs in community and public health continue to privilege theory and publication, leaving graduates ill-equipped for the data-driven, highly visible, and cross-sector roles that contemporary crises demand. It further highlights student anxiety over uncertain career stability and the exodus of experienced mentors.

This commentary synthesizes workforce surveys, qualitative accounts of threatened officials, and curricular audits to demonstrate the widening gulf between training and practice. It argues that doctoral education must shift from insular scholarship to practice-anchored leadership and proposes four interlocking reforms: (1) integrate competencies in leadership, informatics, health equity, policy translation, and crisis communication into core coursework; (2) mandate extended,

mentored placements across governmental, non-profit, and industry settings to cultivate applied proficiency; (3) build career and mentorship infrastructures that normalize trajectories beyond academia and support professional identity formation; and (4) embed resilience, media literacy, and public-engagement training to prepare graduates for politicized environments.

By reframing doctoral study as preparation for service as well as inquiry, universities can cultivate leaders who convert evidence into action, navigate ideological headwinds, and restore public trust. The pandemic served as a stress test; the next emergency will judge whether doctoral education has learned. An outward-looking, practice-oriented, and people-centered curriculum is therefore not optional, but imperative.

Keywords: Doctoral public health education, Workforce readiness, Practice-oriented curriculum, Experiential learning placements, Leadership & informatics competencies, Crisis communication training, Policy translation & implementation

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Introduction

The COVID-19 pandemic revealed the vulnerabilities of public health systems worldwide, showing how local, state, and national infrastructures are ill-equipped to respond to prolonged crises. In the United States, public health agencies experienced a staggering reduction in personnel, with nearly half of state and local employees departing between 2017 and 2021, intensified by pandemic pressures.^{1,2} As the field's limitations have become more visible, doctoral students pursuing an education in community and public health have been confronted with a stark reality: the demand for skilled professionals stands

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in contrast to their own uncertainty about professional pathways beyond academia.

Although examples of innovative doctoral training exist globally, the focus of this commentary is the United States. References to programs outside the U.S. are provided to illustrate alternative approaches, but the analysis and recommendations are grounded in the structure, policies, and workforce challenges of U.S. public health doctoral education. These international examples serve as comparative touchpoints rather than primary subjects, offering context for how U.S. programs

might adapt successful strategies to their own structural realities.

Despite unprecedented public attention, many doctoral candidates remain unaware of opportunities in health departments, nonprofit agencies, industry, policy, and advocacy. While enrollment in graduate public health programs surged during and shortly after the pandemic, confidence in entering a field heavily politicized and scrutinized remains tenuous.³ The traditional academic curriculum, built around research and publication, no longer suffices in preparing students for the multifaceted demands of contemporary public health practice.

Therefore, this commentary argues that doctoral education must be reimagined to include interdisciplinary, applied, and experiential training. Such reform is essential not only to meet the evolving roles in community and public health revealed by COVID-19, but also to empower graduates to thrive in an environment where public trust, political pressures, and cross-sector engagement define success. While this commentary focuses on doctoral training, it is important to recognize that public health leaders emerge from many pathways, including Master of Public Health (MPH) programs, field-based leadership initiatives such as the CDC's Epidemic Intelligence Service, and professional advancement through lived experience and community leadership.

The reforms proposed here are most relevant to doctoral programs in the United States, especially research-focused PhD programs, but elements may also inform practice-focused DrPH programs that wish to better prepare graduates for applied roles. Only through intentional curricular innovation and professional development can we cultivate resilient public health leaders capable of responding to current and future challenges.

At its core, the problem is a growing disconnect between what U.S. doctoral programs in community and public health emphasize, and what the workforce urgently needs. While programs often center on academic research and publishing, the public health system, strained by staffing losses, politicization, and rapid shifts in technology, demands leaders who can operate across sectors, translate evidence into policy, and engage communities under pressure. This misalignment leaves many graduates well-trained in scholarship

but underprepared for the practical, high-stakes roles that define public health leadership today.

COVID-19 as a Stress Test for the Public Health Workforce

The COVID-19 pandemic served as a revealing stress test for public health systems, exposing severe workforce shortages and widespread burnout. A longitudinal analysis of the Public Health Workforce Interests and Needs Survey (PHWINS) documented that nearly half of U.S. community and public health workers, 46% of state and local public health employees, exited their roles between 2017 and 2021, marking a major decline in public health staffing during that period, with attrition rates reaching 75% among younger staff (≤ 35 years) or recently hired.^{1,4} This exodus, already ongoing before the pandemic, intensified as emergency response demands overwhelmed understaffed agencies.

Concurrently, healthcare workers suffered dramatic increases in burnout. A meta-analysis of hospital-based staff during COVID-19 reported emotional exhaustion rates exceeding 50%, with nursing professionals in particular experiencing alarming levels of fatigue and stress.^{5,6} The confluence of longer shifts, high patient mortality, and moral injury took a heavy toll on workforce sustainability.

These challenges also underscored a pressing need for expanded skill sets. The pandemic response demanded competencies in real-time data analytics, crisis communication, cross-sector coordination, and policy translation; skills rarely emphasized in traditional doctoral curricula.^{3,7-12} Epidemiologists and public health practitioners found themselves navigating media briefings, interpretive dashboards, rapidly shifting policy frameworks, and community engagement, all while managing burnout and staffing instability.

The key lesson from these converging crises is clear: academic preparation focused exclusively on research and theory is simply no longer sufficient. Doctoral training must evolve to integrate interdisciplinary competencies and real-world, intensive/demanding applications. Programs should actively cultivate capabilities in leadership, communication, systems thinking, and emergency response to prepare students for the complex, dynamic roles emerging in the 21st century public health landscape.

Political Headwinds and Career Uncertainty

As the pandemic unfolded, public health became a battleground of ideology. Health officials reported widespread harassment, ranging from doxxing and verbal abuse to death threats, often tied to local mitigation policies like mask mandates and business closures. A qualitative analysis of public health officials in California found recurrent themes of psychological trauma and systemic backlash, reinforcing a climate where safety at work could not be sustained and effective without protection.^{13,14}

Quantitative data reinforce the gravity of these attacks. One study reported that between 2020 and 2021, 20–25% of U.S. adults believed harassment of public health leaders was justified; a troubling normalization of threats.¹⁵ This environment of hostility has exerted a significant toll: departures from health departments increased, and morale deteriorated under intense stress.¹⁴⁻¹⁶

For doctoral students, these developments have eroded confidence in a public health career. Surveys conducted during the pandemic linked COVID-related anxiety with future career worry, a dynamic intensified by fear-driven depression among emerging professionals.^{17,18} Added to this is funding volatility, such as recent significant federal budget cuts, thus students face a professional pathway rife with uncertainty. Positions in government and academia alike are no longer seen as safe or stable, while alternative roles in non-governmental organizations (NGOs), industry, and policy remain obscure.

The convergence of political hostility, threats to personal safety, and uncertain career stability has fostered anxiety and disillusionment among doctoral candidates. Many now question what a public health career means in a world where science can provoke backlash and where funding may vanish overnight. Addressing this unease is imperative. Doctoral programs must not only equip students with technical expertise, but also prepare them to weather resistance, meaningfully connect with the community, and navigate the unpredictable terrain of not only modern public health practice but to stay resilient within a society becoming increasingly skeptical of public health institutions.

Limitations in Current Doctoral Training Models

Despite the evolving demands of contemporary public health, doctoral training has remained largely tethered to traditional academic models. Many doctoral programs prioritize theoretical inquiry,

methodological rigor, and publication, with limited attention to skills essential for practice.⁸ Dinov's analysis of health science doctoral curricula highlights this imbalance, emphasizing quantitative methods and data analytics, but notes that without integration of real-world competencies, graduates are poorly prepared to lead in applied settings.¹⁸

Moreover, essential competencies—leadership, policy engagement, systems thinking, and effective communication, remain underdeveloped. A scoping review by O'Leary et al. affirmed that public health PhD programs often lack structured training in these areas, despite widespread recognition that doctoral-level leaders require such skills to catalyze organizational change and cross-sector collaboration.¹⁹ The absence of these competencies hinders the graduates' ability to translate research into action.

Finally, exposure to diverse work environments, such as government agencies, NGOs, and private-sector health entities, is minimal. While experiential placements are common in MPH programs, they remain rare in doctoral training, limiting students' understanding of alternative career pathways and reducing confidence in their practical preparedness.^{8,18,20}

The feasibility of integrating practice-based elements varies by degree type. DrPH programs, designed as professional doctorates, usually incorporate applied competencies and field experiences, whereas PhD programs remain largely focused on research specialization. Embedding extended residencies, applied policy work, or crisis communication training into a PhD curriculum would likely require adjustments in program length, funding, and faculty evaluation criteria. Without such adaptations, a persistent gap remains between doctoral ambition and real-world demand: graduates may excel in scholarship yet lack grounding in leadership, stakeholder engagement, and systems-level thinking. This misalignment not only fuels uncertainty about career identity but also narrows the pipeline of public health professionals prepared to meet the field's most pressing challenges.

Examples of Practice-Oriented Doctoral Programs

Several DrPH programs have embedded robust experiential learning to cultivate leadership skills that transcend academia. At Harvard T.H. Chan, an eight-to-ten-week Summer Field Immersion, often

followed by optional winter field modules, places candidates inside ministries of health, nongovernmental organizations, or corporate social-responsibility divisions, where they confront live policy and operational challenges.²¹ Johns Hopkins Bloomberg likewise integrates a 100- to 300-hour practicum, coordinated with coursework in strategic planning and communication, that routinely situates students at the CDC, state health departments, or pharmaco-vigilance units to apply those competencies in practice.²² The London School of Hygiene & Tropical Medicine extends this principle through a three- to six-month organizational and policy-analysis placement, positioning fellows to diagnose governance and financing constraints and craft actionable reform plans for host agencies.²³ UNC Gillings adopts a hybrid model: six week-long leadership intensives, domestic or international, are paired with an applied practice project that yields measurable improvements for external clients while honing negotiation and coalition-building skills.²⁴ UC Berkeley requires a semester-length professional residency in venues ranging from legislative offices to health-system analytics hubs, giving students the chance to demonstrate translational leadership and build non-academic professional networks.²⁵ Finally, Columbia Mailman's Applied Practice Experience (APEX) obliges every DrPH candidate to deliver professional-grade outputs for global partners such as WHO, FEMA, or Deloitte, thereby expanding graduates' portfolios and international contacts.²⁶ Taken together, these residencies, intensives, and practica deliberately cultivate strategic management, stakeholder negotiation, evidence translation, and organizational-change proficiencies, competencies highly sought by government, multilateral, and private-sector employers, demonstrating that contemporary doctoral education can purpose-build leaders for the complex realities of public-health practice. Importantly, the design and outcomes of these DrPH initiatives can serve as adaptable models for both other DrPH programs and research-focused PhD programs seeking to incorporate more applied, practice-oriented training without compromising scholarly rigor.

Recommendations for Modernizing Public Health Doctoral Education

To ensure doctoral graduates are prepared for the multifaceted landscape of public health, we propose the following strategic reforms:

A. Curriculum Modernization

Doctoral programs should explicitly integrate competencies such as leadership, health equity, implementation science, informatics, and policy analysis. Dinov's framework for modernizing health science curricula emphasizes the inclusion of core analytical and computational skills that align with current technological advancements.¹⁸ Similarly, O'Leary et al. stress that competency-based curricula must foreground leadership and communication to support change agency.^{19,20} Elective modules in digital health innovation, global health diplomacy, public-private partnership strategies, and entrepreneurial thinking would complement foundational competencies and foster agility.

B. Experiential Learning

Structured experiential opportunities are crucial. Programs should establish long-term internships or fellowships with public health departments, nonprofit organizations, consultancy firms, and industry partners. Such placements serve dual roles: enhancing applied competence while increasing career visibility. Dinov underscores the value of multidisciplinary practicum in reinforcing quantitative and translational learning.¹⁹ Doctoral programs adopting "think and work like professionals" models, such as those at Drexel University, provide valuable precedents.²⁷

C. Career Development and Mentorship

Institutions should emulate career support models from medical, law, or business schools by creating dedicated career centers for doctoral students in public health. These resources can guide curriculum vitae (CV) development, networking, and professional identity formation. Mentorship should extend beyond academic advisors to include alumni and professionals in policy, consulting, foundations, and technology sectors. Embedding mentorship pipelines encourages students to explore nontraditional trajectories with confidence.

D. Resilience and Public Trust Training

Training must prepare students for environments where science is politicized, and public trust is tenuous. Media literacy, crisis communication, and trauma-informed leadership techniques, originally developed during COVID-19, should become core components.³ Embedding modules on ethical engagement and cultural humility reinforces public health's foundational commitment to equity and strengthens adaptive capacity during controversy or politicization.

By weaving these elements into doctoral training, programs can cultivate graduates who are not only expert researchers, but also adaptable and resilient leaders versed in communication, policy, and implementation. As we continue to move past the recent global pandemic, this holistic reorientation is imperative, not optional, for preparing the next generation of public health professionals capable of navigating complexity, driving systemic change, thus providing good health care.

Implementing these reforms will require addressing significant institutional barriers. Faculty evaluation systems often prioritize publications over community engagement or policy impact, making it challenging to incentivize practice-based teaching and mentorship. Funding for extended field placements can be limited, especially in resource-constrained public universities. Additionally, doctoral supervision models may need to evolve to include mentors from practice settings alongside academic advisors. Recognizing and planning to meet these challenges can make reforms more realistic and sustainable.

Conclusion and Call to Action

The COVID-19 pandemic not only laid bare the structural vulnerabilities of global public health systems but also exposed deep fissures in how we prepare future leaders within the field. It revealed that a workforce trained primarily for academic inquiry cannot be expected to thrive amid operational crises, shifting political landscapes, and community-level distrust. Doctoral students, once inspired by the promise of transformative work, now confront an uneasy reality: the traditional pathways feel misaligned with the demands of our

world in flux. Many face a profound lack of clarity about where, in fact, their education leads, while also grappling with a profession that has at times become a target rather than a refuge.

This moment presents a critical opportunity to rethink and renew doctoral education. If we are to build a resilient and future-ready public health workforce, doctoral education cannot remain insulated from the world it seeks to change. It must be reimagined: intentionally, urgently, and unapologetically. Programs must integrate real-world skills, cultivate adaptive leadership, foster cross-sector collaboration, and expose students to the realities of practice that exist beyond the academy.

Faculty and institutions have a responsibility not only to educate, but to inspire; and prepare scholars who are as comfortable in communities, boardrooms, and legislatures as they are in classrooms and laboratories. Funders and policymakers, too, must support infrastructure that values applied knowledge and public trust as much as traditional publication metrics.

Rhetoric is no longer enough. Community and public health doctoral programs now demand bold vision and decisive action. At this crossroads, we can recast doctoral training as a foundation for graduates who can lead effectively in diverse, high-stakes environments. Integrating universities with nonprofit and industry partners will channel talent toward these urgent challenges. Educators, policymakers, and students must design curricula that mirror the world graduates will enter. The next cohort is ready, if we equip them to lead.

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