Assessing the landscape of public health disaster research: A research note describing the initial findings from the PHEER Community of Practice Survey (13 July 2023)

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Introduction

The Public Health Extreme Events Research (PHEER) network serves as an organizing resource for the public health disaster science community of practice, with a particular focus on supporting the deployment and dissemination of rapid public health disaster research in the public's interest. In PHEER's first year the leadership team has focused on developing the infrastructure necessary to support the community of practice, establishing the scope of PHEER research, building a governance structure, and developing a Concept of Operations (CONOPs) to guide its activities. Future PHEER deployments may involve assembling or sponsoring research teams; facilitating access to disaster areas; conducting virtual surveillance; and broadly sharing data and insights with affected communities, scientific colleagues, and policy-makers, practitioners, and funders. These activities depend upon an academic field of engaged and experienced researchers. This memo describes the PHEER leadership's effort to characterize the community of practice and to develop a network of individual members.

Methods

The Public Health Disaster Research Community of Practice survey was informed by two objectives: (1) to build a network of public health disaster researchers, and (2) to characterize the community of practice in terms of its disciplinary interests, methodological expertise, and disaster experience. The survey instrument was designed as a brief self-administered online tool to collect membership contact information in addition to data characterizing individuals' professional interests and expertise, tenure and scope of work in the field, and level of engagement with the field of disaster science. The study design and survey instrument were reviewed by the NYU institutional review board and deemed exempt as human subjects research. The survey was conducted as a convenience sample: invitations to participate in the survey and join the membership of PHEER were sent to networks of selected senior disaster researchers; to attendees at the Preparedness Summit tabletop exercise in April 2023; to all SSEER members who listed public health as a domain of expertise or affiliation; to the DisasterGrads listserv maintained by the Natural Hazards Center (NHC); and to recipients of NHC public health grants. The online survey will remain open as an ongoing recruitment and registration tool as well as a dynamic characterization of the community of practice as reflected by PHEER membership.

Findings

As of July 7, 2023, there were 132 individuals who joined the PHEER network and completed the survey. **Overall, this cohort of initial members drawn from the public health disaster research community reflects a seasoned, methodologically and geographically diverse, and engaged academic workforce.**

There was widespread geographic representation, with respondents drawn from 31 states and Washington DC, in addition to Puerto Rico, Canada, as well as New Zealand, Switzerland, and Argentina, and several other international sites. Those states with the greatest representation included New York (13), Maryland (12), Texas (9), and California (8). As illustrated in Table 4, participants were affiliated with a broad range of academic institutions as well as governmental agencies and non-profit and consulting organizations. Approximately three-quarters of respondents identified their primary professional area as research (77%, see Table 1), with the remainder divided between the policy (10%) and practice arenas (13%).

Among the 102 individuals who characterized their primary work arena as research, 63% regarded themselves as "core hazards or disaster researchers" whose primary work focus was disaster science (Table 2). Approximately one-quarter of researchers are more tangentially associated with disaster research, either engaging in disaster studies when opportunities presented themselves or considering hazards research a secondary field of interest. A number of respondents (12%) defined themselves as students or new investigators, "emerging researchers" in the field. As illustrated in Table 5, approximately one-quarter of respondents reported fewer than five years of disaster research experience and three-quarters reported six or more years of experience.

Respondents described their areas of methodological interest and expertise in terms of the scientific approaches to data collection and analysis that they employed in their work. These 32 specifically-defined scientific methods were then organized into eight overarching categories, as illustrated in Table 3. Each individual could select as many areas as applied, so the table is configured as a rank-ordered set of methodological approaches. The most commonly-reported scientific approaches included a broad set of quantitative methods that included experimental, quasi-experimental, primary data collection, and survey research (67%); qualitative approaches such as case study methods, narrative analyses, ethnographic research, and key informant interviews (64%); community-focused approaches such as community-based participatory research and participatory action research (61%); and "big data" approaches that included use of electronic health records, secondary data sets, GIS, and modeling techniques (54%). Approximately one-quarter of respondents study natural hazards only, and an additional quarter study all types of disasters, including biological, technological, and terrorism (Table 9). As noted in Table 10, most respondents reported applied scientific fields as their primary academic discipline, such as emergency management, environmental health, epidemiology, and planning, among others.

As illustrated in Table 6, a large majority of respondents, 80%, are doctorally trained, either as PhD (63%) or as DrPH (7%), MD (4%), JD (1%), or as other doctorates (5%). Twenty-three respondents reported their highest degree as an MPH or other Masters (17%), and four members reported other degrees or certifications (3%). Demographically, as illustrated in Table 8, respondents are primarily middle-aged (71% between the ages of 31-55), female (60.2%), and self-described as non-Hispanic white (61.4%). There are minor differences in racial and ethnic composition by respondents' primary professional arena, but small sample sizes make any broader generalizations less convincing.

A number of survey respondents participate in other disaster research networks. PHEER is one of seven extreme event research or reconnaissance networks that are organized under the umbrella of the NSF-funded CONVERGE disaster science partnership. Each of these disciplinary-specific networks defines its scope of research interests and operational approaches. All share a commitment to developing their

respective academic subfields, mentoring future generations of disaster scientists through their network activities, and encouraging inter-disciplinary science approaches. In addition to these extreme event research networks, the National Institute of Environmental Health Sciences supports DR2, the Disaster Research Response program, whose mission is to, "provide training, funding, and a Resources Portal of tools to empower human health research in response to disasters and public health emergencies." The PHEER survey sought to capture the intersecting memberships among PHEER and these research networks. As illustrated in Table 7, approximately two-fifths of PHEER members belong to at least one of these other networks. The greatest intersection is among the Social Sciences Extreme Event Research network (40, 30.3%) and DR2 (18, 13.6%). The connection with SSEER is not surprising, given that one significant outreach effort targeted those SSEER members who listed public health as an area of methodological or substantive expertise or interest. Similarly, DR2 is engaged in similar community-building and supportive activities for the disaster research community, particularly among scientists involved in environmental hazards research areas.

Conclusion

These preliminary findings from the initial set of respondents to the PHEER Community of Practice Survey suggest that there is a strong foundation of geographically-distributed, highly-trained, and seasoned public health disaster scientists interested in participating in the PHEER network, and that there is also a significant cohort of emerging scientists presently in training or in early-career positions. The range of scientific approaches is impressive, reinforcing the promise of diverse analytic strategies and inter-disciplinary team science, as well as the fundamental capacity of such a cohort to conduct a variety of data collection efforts. Lastly, a large number of these public health disaster scientists already participate in other research networks, each of which has distinctive resources and strengths. As the ecosystem of such collaborative research networks mature there should be substantial opportunities for mutual support among these networks as well as collective action in the public's interest.

Data Tables

Table 1. Respondents by Primary Professional Area (n=132)

Domain	n	%
Research	102	77.3
Practice	17	12.9
Policy & Other	13	9.8

Table 2. Primary Professional Area x Public Health Disaster Science Engagement (n=128)

	Research	Practice	Policy + Other	TOTAL
n	102	13	13	128
Core researcher	64 (62.8)	3 (23.1)	5 (38.5)	72 (56.3)
Periodic researcher	23 (22.6)	5 (38.5)	5 (38.5)	33 (25.8)
Situational researcher	3 (2.9)	2 (15.4)	0	5 (3.9)
Emerging researcher	12 (11.8)	3 (23.1)	3 (23.1)	18 (14.1)

*Note: A **Core Researcher** strongly self-identifies as a hazards/disaster researcher, has a deep commitment to the field, and has engaged in hazards and disaster research for a sustained period of time. A **Periodic Researcher** is not primarily engaged in hazards and disaster research but focuses on related topics from time to time throughout one's professional career. A **Situational Researcher** has not*

*previously trained or been involved in the hazards field, but had the opportunity to study new phenomena or processes based on a situational disaster event. An **Emerging Researcher** includes students and others who are new to the field and who are still learning about its disciplinary, multidisciplinary, or interdisciplinary histories, theories, methods, and approaches. Emerging researchers may have limited experience or may not have yet conducted their own original empirical research.*

Table 3. Methodological expertise (n=132)

Method	N	%	Research strategies
Quantitative: survey	88	66.7	Experimental, quasi-experimental, 1° data, survey research
Qualitative	85	64.4	Case study, ethnography, focus groups, interviews, narratives
Community-engaged	80	60.6	CBPR, Participatory Action Research
Big data	71	53.8	Modeling, AI, 2° Data, EHR, GIS
Policy science	65	49.2	Evaluation, policy analysis, health impact assessments, org. analyses
Epidemiological	46	34.9	Epidemiological
Exposure + Risk	33	25.0	Risk assessments, exposure science, biological data
Social network	11	8.3	Social network analyses

Note: Multiple categories of methodological expertise are possible for any given individual, so percentages add to greater than one hundred percent

Table 4. Primary Institutional Affiliation

Appalachian State University
Arizona State University
Association of University Centers on Disabilities (AUCD)
Austin Public Health
Barton Dunant - Emergency Management Training and Consulting
Boston University School of Public Health
CDC
California State Polytechnic University, Pomona
California State University, East Bay
Case Western Reserve University School of Medicine
Centro Latino de Bioetica y Humanidades, San Juan, Puerto Rico
City University of New York: Graduate School of Public Health and Health Policy
City University of New York: Hunter College
Clemson University
Columbia University
Dezful University of Medical Sciences, Iran
Dianohia Academy College
ETH Zurich
East Carolina University
Federal University Otuoke
Florida International University
George Mason University
Georgetown University
Gordon River Consultancy
HHS/NIH/NIEHS

Harris County Public Health
Harvard T H Chan School of Public Health
Healthcare Ready
Houston Health Department
Johns Hopkins Bloomberg School of Public Health
Kaiser Permanente, San Francisco
MDB, Inc.
Maricopa County Department of Public Health
Michigan Technological University
Middle Tennessee State University
Ministry of Education/ Copperbelt University
Minneapolis Health Department
NYC Pandemic Response Institute
National Center for Disaster Medicine and Public Health
National Institute of Public Health of Quebec
New York University School of Global Public Health
New York University School of Medicine
Old Dominion University
Oregon State University
Penn State
Public Health Institute
Purdue University
RAND Corporation
Resilience Development Initiative (RDI), Indonesia
Rowan University
SGNL Solutions
Seioyn University
SUNY – University of Albany
SUNY – University at Buffalo
SUNY – Stony Brook University
TCU
Tetra Tech
Texas A&M School of Public Health
The George Washington University School of Medicine and Health Sciences
The George Washington University School of Public Health
The National Center for Disaster Medicine and Public Health (NCDMPH)
Uniformed Services University of the Health Sciences
University of California, Irvine
University of California, Los Angeles
University of California, San Francisco
University of Chicago
University of Colorado
University of Delaware

University of Florida
University of Groningen
University of Hawaii at Manoa
University of Helsinki (Finland)
University of Illinois, Urbana Champaign
University of Iowa
University of Maryland College Park
University of Melbourne
University of Michigan
University of Nebraska Medical Center, College of Public Health
University of North Carolina at Chapel Hill
University of Notre Dame
University of Oklahoma
University of Otago, Wellington, New Zealand
University of Puerto Rico Medical Sciences Campus
University of South Florida, College of Public Health
University of Southern California
University of Tennessee Health Science Center
University of Tennessee, Knoxville
University of Texas at San Antonio
University of Utah
University of Vermont
University of Washington
University of Wisconsin-Platteville
University of Wisconsin-Madison
Yale School of Public Health

Table 5. Disaster Research Years of Experience (n=128)

Time frame	n	%
<1 year	8	6.3
1-5 years	27	21.1
6-10 years	34	26.6
11+ years	59	46.1

Table 6. Academic Degrees (n=132)

Degree	n	%
PhD only	47	35.6
PhD + MPH	19	14.4
PhD + Other Masters	17	12.9
Other Masters	12	9.1
MPH	11	8.3
DrPH, alone or + Other Degree	9	6.8
Other doctorate	7	5.3
MD, alone or + Other Degree	5	3.8
Other degrees	4	3.0
JD, alone or + Other Degree	1	1.0

Table 7. Participation in Extreme Event Research or Reconnaissance Networks (n=132)

Research Network	n	%
SSEER – Social Science	40	30.3
GEER – Geotechnical	3	2.3
StEER – Structural Engineering	6	4.6
NEER – Nearshore	2	1.5
SUMMEER – Sustainable Materials	2	1.5
OSEEER – Operations Science	0	0
DR2 – NIEHS Disaster Research Response	18	13.6
Any of the above networks	56	42.4

Table 8. Demographics

	TOTAL	Research	PH Practice	Policy + Other
n	128	102	13	13
Age				
18-30	7.0	4.9	15.4	15.4
31-55	71.1	71.6	69.2	69.2
56+	21.9	23.5	15.4	15.4
Gender				
Male	36.7	35.3	38.5	46.2
Female	60.2	60.8	61.5	53.9
Non-binary	2.3	2.9	0	0
Prefers not to answer	1.0	1.0	0	0
Race and Ethnicity				
Non-Hispanic White	61.4	63.7	41.2	69.2
Non-Hispanic Black	7.6	6.9	11.8	7.7
Hispanic	7.6	8.8	0	7.7
Multi-racial	18.9	15.7	41.2	15.4
Other	4.6	4.9	5.9	0

Table 9. Hazards Studied

Hazard Type	N	%
Bio only	2	1.6
Bio + Natural	20	16.3
Bio + Natural + Techno	3	2.4
Bio + Natural + Techno + Terror	32	26.0
Bio + Natural + Terror	13	10.6
Bio + Terror	1	1.0
Natural only	34	27.6
Natural + Techno	8	6.5
Natural + Techno + Terror	3	2.4
Natural + Terror	7	5.7

Table 10. Top Ten Scientific Disciplines (n=132)

Discipline	N	%
Emergency management	37	28.0
Environmental health	32	24.2
Social and behavioral sciences	30	22.7
Critical disaster studies	26	19.7
Public health systems research	24	18.2
Epidemiology	23	17.4
Public health practice	22	16.7
Decision-making and risk analysis	22	16.7
Health policy and management	18	13.6
Planning	13	9.9

Note: Multiple categories of scientific discipline are possible for any given individual, so percentages add to greater than one hundred percent