Evidence-Based Practice for Public Health Emergency Preparedness and Response

Informing Future Emergency Preparedness Efforts
GUIRR Meeting/NASEM
David Abramson, PhD MPH (NYU)
14 Oct 2020

Committee Membership

- **BRUCE (NED) CALONGE (*Chair*),** The Colorado Trust
- **DAVID ABRAMSON,** New York University College of Global Public Health
- **JULIE CASANI,** North Carolina State University
- **DAVID EISENMAN,** University of California, Los Angeles
- **FRANCISCO GARCIA,** Pima County
- **PAUL HALVERSON,** Indiana University
- **SEAN HENNESSY,** University of Pennsylvania
- **EDBERT HSU,** Johns Hopkins University
- **NATHANIEL HUPERT,** Weill Cornell Medicine, Cornell University
- **REBECCA MAYNARD,** University of Pennsylvania
- **SUZET MCKINNEY,** Illinois Medical District
- **JANE NOYES**, Bangor University
- **DOUG OWENS,** Stanford University
- **SANDRA QUINN,** University of Maryland
- **PAUL SHEKELLE,** Southern California Evidence-Based Practice Center, RAND Corporation
- **ANDY STERGACHIS,** University of Washington
- **MITCH STRIPLING,** Planned Parenthood Federation of America
- **STEVEN TEUTSCH,** University of California, Los Angeles, and University of Southern California
- **TENER VEENEMA,** Johns Hopkins University
- **MATTHEW WYNIA,** University of Colorado

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Charge to the Committee

- Develop the methodology for conducting a comprehensive review of evidence for public health emergency preparedness and response (PHEPR) practices, including the criteria by which to assess the strength of evidence and a tiered grading scheme;
- Develop and apply criteria to determine which PHEPR capabilities should be prioritized for inclusion in the comprehensive review;
- Apply the committee's evidence review methodology to assess the effectiveness of the selected practices;
- Develop recommendations for practices that communities, state, territorial, local, and/or tribal agencies should or should not adopt, based on evidence; and
- **Provide recommendations for future research to address critical gaps, as well as processes needed to improve the overall quality of evidence within the field.**

U.S. Preventive Services TASK FORCE

The Community Guide

Evidence-to-Decision Processes

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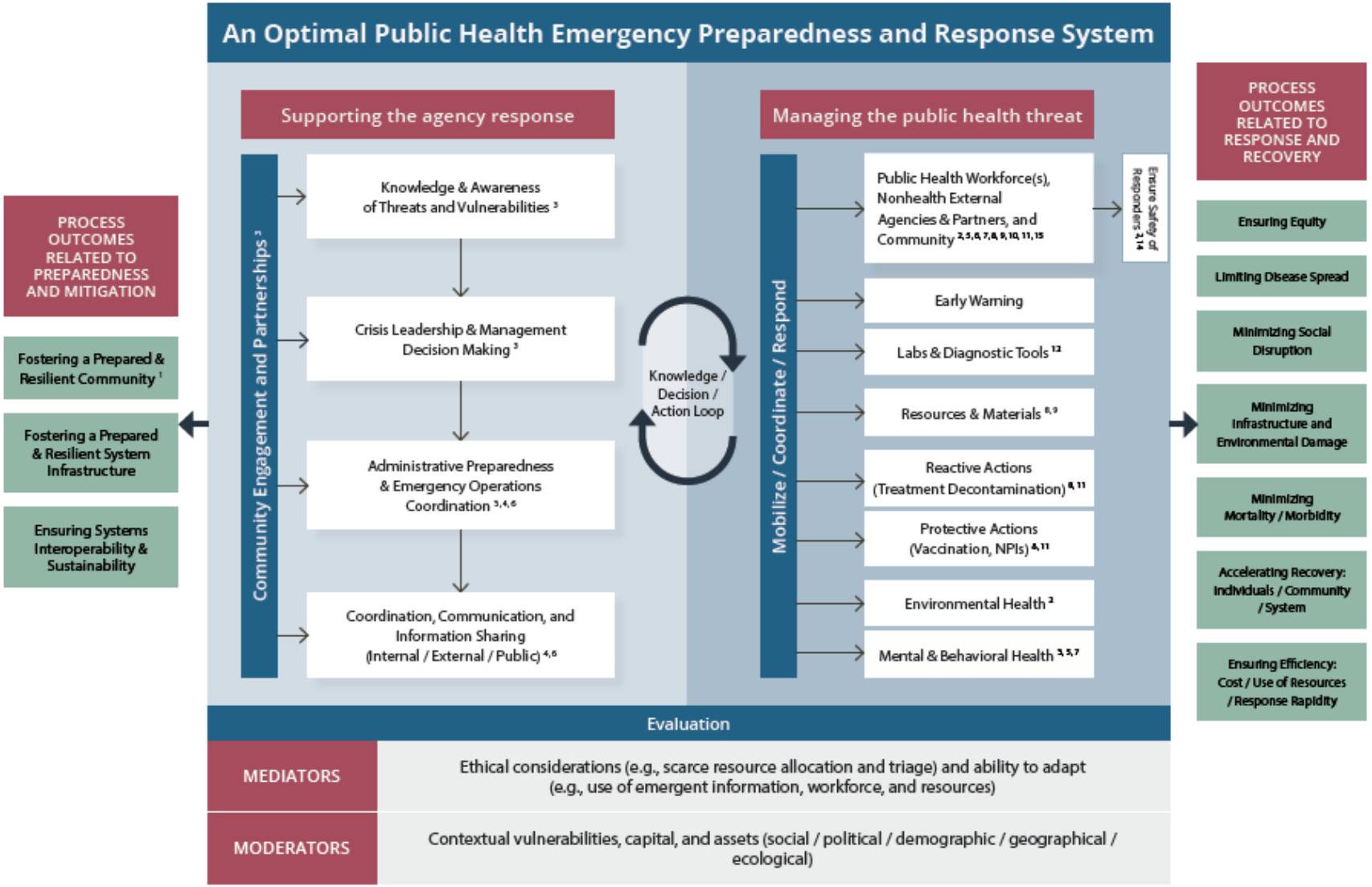

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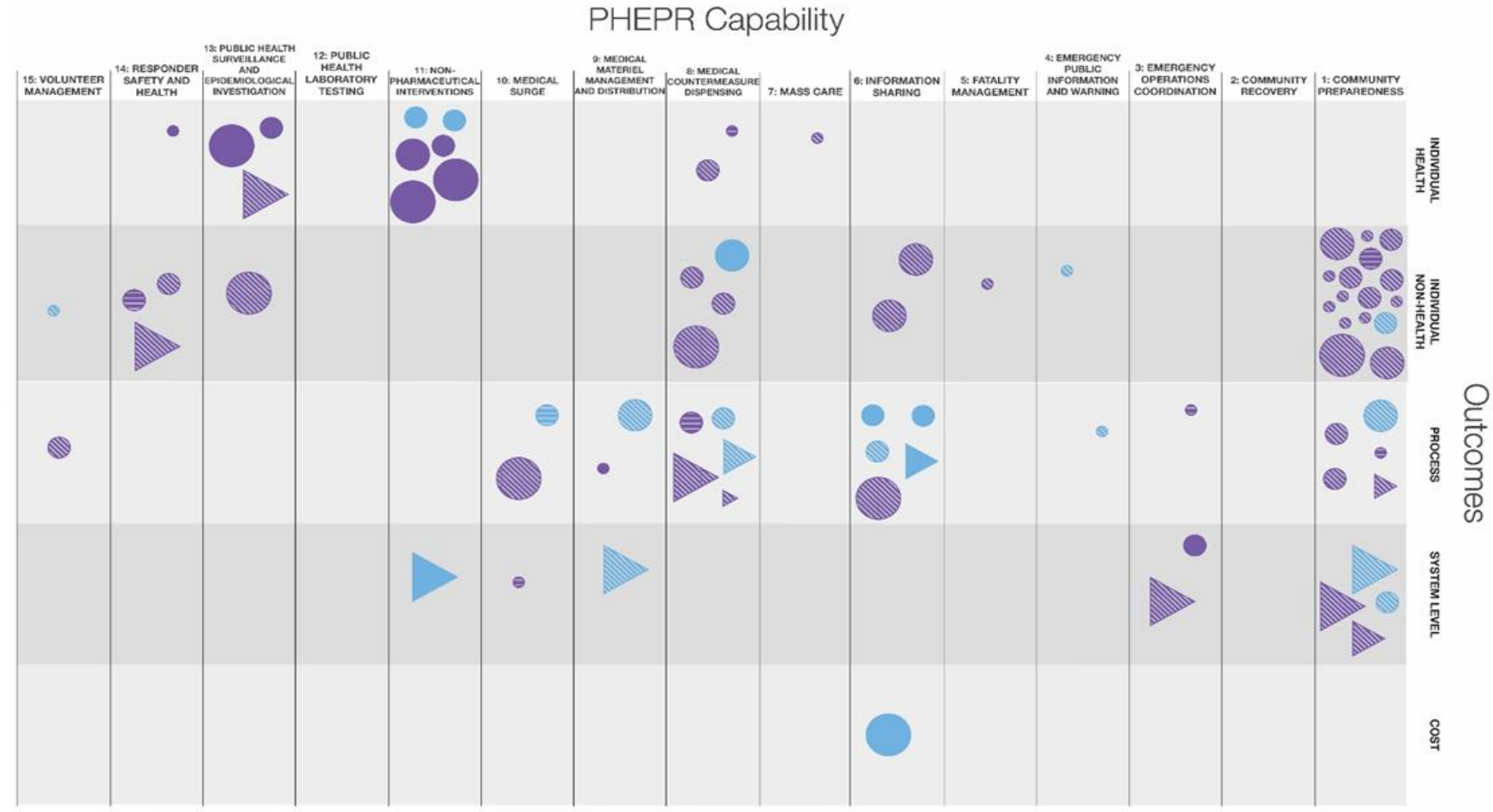
A Broader View of the State of the Evidence for PHEPR

Results from Commission Scoping Review and Evidence Maps: U.S. Impact Studies



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Major prior and current efforts to stimulate or coordinate PHEPR research

- **Preparedness and Emergency Response Research Centers**, PERRC's (CDC), 2008-2014
- **Preparedness and Emergency Response Learning Centers**, PERLC's (CDC), 2009-2015
- **Superstorm Sandy Supplemental** (ASPR), 2013-2014
- **Deepwater Horizon Research Consortia** (NIEHS), 2010-2014
- **Disaster Response Research**, DR2 (NIEHS and NLM), 2016-present

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Identifying Disaster Medical and Public Health Research Priorities: Data needs arising in response to Hurricane Sandy

Meeting Summary

November 16, 2012

In October 2012, Hurricane Sandy caused widespread devastation in the Mid-Atlantic and Northeastern United States, as well as parts of the Caribbean. On November 16, 2012, the Institute of Medicine (IOM) and The New York Academy of Medicine (NYAM) hosted a meeting at the NYAM Conference Center in New York City to 1) Explore challenges faced during preparation, response, and recovery to Hurricane Sandy; 2) Identify gaps in knowledge affecting disaster preparedness and response; and 3) Develop a set of priorities for near-term research based on Hurricane Sandy and other recent disasters that may inform future disaster preparedness, response, and recovery plans.[1]

Invitees to the meeting included New York City, New York State, New Jersey, and federal government agency representatives; health care providers; academia; first responders; community organizations; philanthropic organizations; and disaster preparedness and response experts.[2] Participants were welcomed to NYAM by Ruth Finkelstein, NYAM Senior Vice President for Policy and Planning. The meeting was chaired by the co-chairs of the IOM Forum on Medical and Public Health Preparedness for Catastrophic Events, Robert Kadlec, RPK Consulting LLC; and Lynne Kidder, President, Bipartisan WMD Terrorism Research Center.

Nicole Lurie, Assistant Secretary for Preparedness and Response, Department of Health and Human Services (DHHS), offered opening remarks, explaining that the meeting should not be viewed as an "after-action review," but an opportunity to identify, while events are still fresh in people's minds, the information needs that arose for decision-makers and responders as they attempted to serve the people in the area affected by the storm. It was noted that funders had

[1] This is a very brief meeting summary relaying the key meeting findings in relation to stated meeting objectives 2 and 3. More detailed meeting notes can be obtained by contacting Rosemary Alcantara at The New York Academy of Medicine: ralcantara@nyam.org.
[2] A list of meeting participants is in Appendix 1.

2012

The NEW ENGLAND JOURNAL of MEDICINE

SOUNDING BOARD

Research as a Part of Public Health Emergency Response

Nicole Lurie, M.D., M.S.P.H., Teri Manolio, M.D., Ph.D., Amy P. Patterson, M.D., Francis Collins, M.D., Ph.D., and Thomas Frieden, M.D., M.P.H.

In the past decade, a succession of public health emergencies has challenged preparedness and response capacities of government agencies, hospitals and clinics, public health agencies, and academic researchers, in the United States and abroad. The epidemic of the severe acute respiratory syndrome (SARS), the 9/11 terrorist attacks, and the anthrax mailings stand out as signal examples in the early years of the decade. In addition to natural disasters such as the 2010 earthquake in Haiti and the 2012 Superstorm Sandy, other recent events — including the 2009 influenza A (H1N1) pandemic, the Deepwater Horizon oil spill, and the Fukushima Daiichi nuclear reactor emergency in Japan — illustrate the diverse and complex forms that threats to public health can assume. Figure 1 displays some examples over the past decade or so and highlights the diversity and frequency of events that can be expected to occur in the foreseeable future.

Each of these emergencies has yielded important information and data that are essential to what is, by design and necessity, an ongoing effort to improve preparedness and response. But each has also underscored a persistent need to be better prepared to resolve important research questions in the context of a public health emergency. The knowledge that is generated through well-designed, effectively executed research in anticipation of, in the midst of, and after an emergency is critical to our future capacity to better achieve the overarching goals of preparedness and response: preventing injury, illness, disability, and death and supporting recovery. We review challenges to the conduct of research in recent public health emergencies to identify critical elements of an effective research response.

CHALLENGES TO SCIENTIFIC RESEARCH IN RECENT EVENTS

Preparedness activities at multiple levels have done much to improve our response to public health emergencies. Systems for surveillance and detection have been strengthened. Vaccines, antitoxins, and other medical countermeasures have been developed and stockpiled, and plans for their effective deployment have been formulated. Local public health authorities and health care systems have also enhanced their own capacities for optimal emergency response. To guide the coordination of responders at the local, state, and federal levels, the United States developed the National Response Framework,[1] which articulates key principles, delineates the roles and responsibilities of responders, and identifies key structures, all of which are integral to an effective, coordinated response to any hazard. Although responses to recent events have typically used the best available science at the time, additional research, done in parallel with and after the response itself, is often essential to address the most pressing knowledge gaps presented by public health emergencies and to ensure that they are addressed by the time another similar disaster strikes. Recent events have also illustrated gaps in planning for, and rapidly executing, scientific research in the context of disaster response. We highlight some challenges to conducting research during recent events and define a series of activities to address them.

INFLUENZA A (H1N1) PANDEMIC

The response to the 2009 influenza A (H1N1) pandemic highlighted progress that has been made in strengthening surveillance, virus characterization, and clinical research infrastructure for the rapid assessment of new vaccines. It also highlighted challenges in gaining sufficient access to clinical data that could immediately inform treatment protocols or identify additional groups at risk.

Shortly after the H1N1 pandemic began, the National Heart, Lung and Blood Institute provided funding to the Acute Respiratory Distress Syndrome Network (ARDSNet) for protocol mod-

2013

Enabling Rapid and Sustainable Public Health Research During Disasters

Summary of a Joint Workshop
by the Institute of Medicine and the
U.S. Department of Health and Human Services

Forum on Medical and Public Health Preparedness for Catastrophic Events

Board on Health Sciences Policy

Megan Reeve, Theresa Wizemann, and Bruce Altevogt,
Rapporteurs

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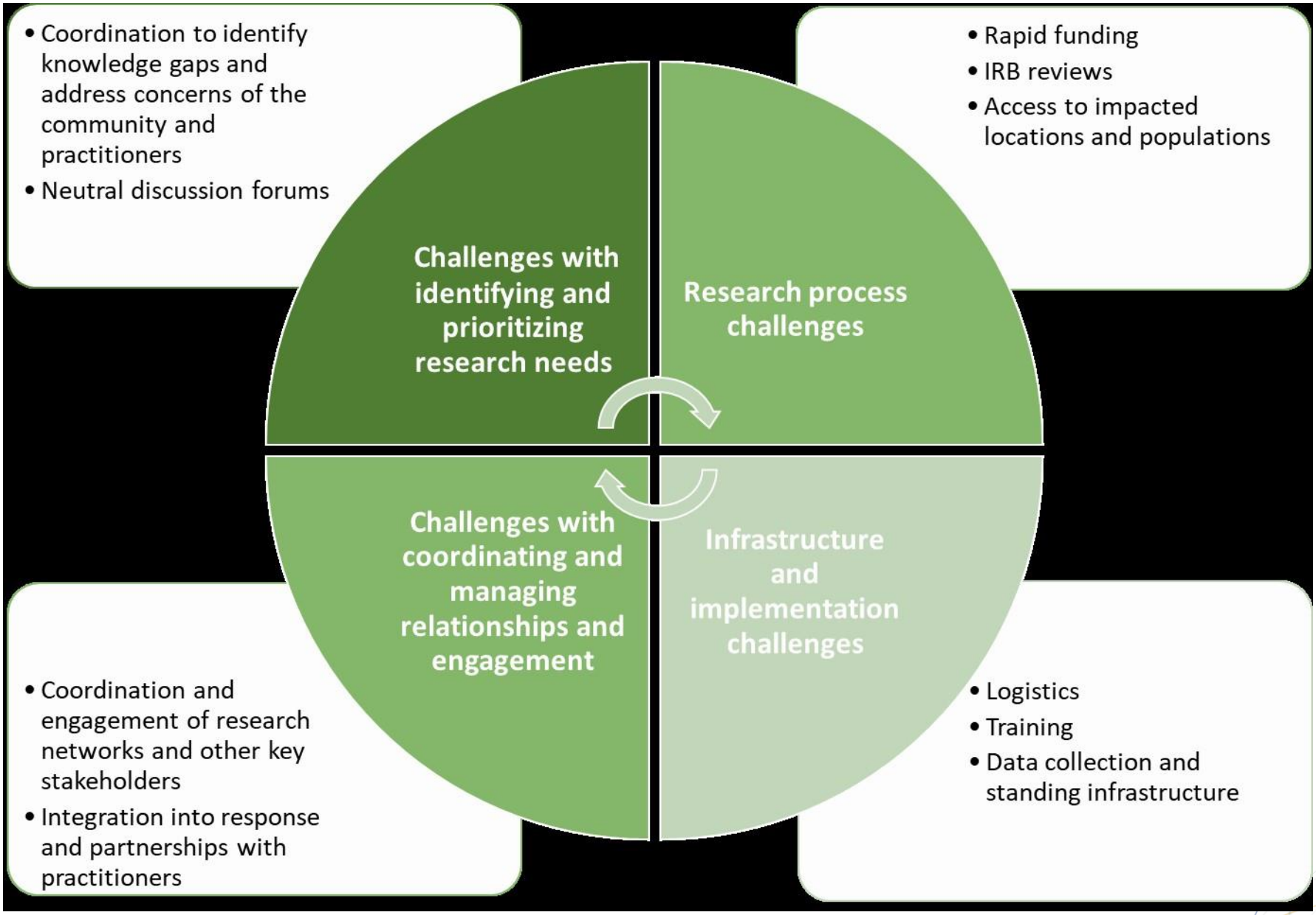
• Coordination to identify knowledge gaps and address concerns of the community and practitioners
• Neutral discussion forums
• Rapid funding
• IRB reviews
• Access to impacted locations and populations
Challenges with identifying and prioritizing research needs
Research process challenges
Challenges with coordinating and managing relationships and engagement
Infrastructure and implementation challenges
• Coordination and engagement of research networks and other key stakeholders
• Integration into response and partnerships with practitioners
• Logistics
• Training
• Data collection and standing infrastructure

Committee Conclusion on the State of PHEPR Evidence

Overall, the committee concluded that the science underlying the nation's response to public health emergencies is seriously deficient, hampering the nation's ability to respond to emergencies most effectively to save lives and preserve well-being.

Building Blocks for fostering an applied scientific discipline

- **Sustained and comprehensive interest in the research findings**
- **Development of a coordinated research agenda**
- **Formation of a foundation of resources, assets, and networks:**
  - **Academic institutions**
  - **Scholars and researchers, including training pipelines**
  - **Networks connecting research to policy and practice**

NSF currently supports seven Extreme Events Research (EER) networks. This EER ecosystem is designed to help coordinate disciplinary communities, while also encouraging cross-disciplinary information sharing and interdisciplinary integration.

PHEER? Public Health Extreme Events Reconnaissance

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RECOMMENDATION 3:

Develop a National PHEPR Science Framework

To enhance and expand the evidence base for PHEPR practices and translation of the science to the practice community, CDC should work with other relevant funding agencies, SLTT public health agencies, academic researchers, professional associations, and other stakeholders to develop a National PHEPR Science Framework so as to ensure resourcing, coordination, monitoring, and execution of public- and private-sector PHEPR research.

RECOMMENDATION 3: Continued…

- Build on and improve coordination, integration, and alignment among existing PHEPR research efforts
- Recognize and support PHEPR science as a unique academic discipline.
- Create a common, robust, forward-looking PHEPR research agenda.
- Support meaningful partnerships between PHEPR practitioners and researchers.
- Prioritize strategies and mechanisms for the translation, dissemination, and implementation of PHEPR research.

ADDITIONAL RECOMMENDATIONS

- Ensure Infrastructure and Funding to Support PHEPR Research
- Improve the Conduct and Reporting of PHEPR Research
- Support Workforce Capacity Development and Technical Assistance Programs for PHEPR Researchers and Practitioners
- Ensure the Translation, Dissemination, and Implementation of PHEPR Research to Practice

Committee's Concluding Thoughts

- The release of this report in the context of the COVID-19 pandemic puts the challenges of limited research to support evidence-based PHEPR practice in bold relief.

- The committee's recommendations around adequate **stable funding**, **robust design and conduct of research studies**, development of the **research workforce** and programs, and a commitment to **collaboration between public health practitioners and experienced researchers** all are vital to ongoing support of the knowledge development for and implementation of interventions that will better protect the public's health and minimize the impact of the broad spectrum of emergencies that have and will certainly continue to threaten the security of our nation.

Thank You!

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RECOMMENDATION 4:

Ensure Infrastructure and Funding to Support PHEPR Research

CDC, in collaboration with other relevant funding agencies, should ensure adequate and sustained oversight, coordination, and funding to support a National PHEPR Science Framework and to further develop the infrastructure necessary to support more efficient production of and better-quality PHEPR research. Such infrastructure should include

- sustained funding for practice-based and investigator-driven research;
- support for partnerships (e.g., with academic institutions, hospital systems, and SLTT public health agencies);
- development of a rapid research funding mechanism and interdisciplinary rapid response teams; and
- enhanced mechanisms to enable routine, standardized, efficient data collection with minimal disruption to delivery of services (e.g., preapproved, adaptable research and IRB protocols, a research arm within the response structure).

RECOMMENDATION 5:

Improve the Conduct and Reporting of PHEPR Research

CDC, the Office of the Assistant Secretary for Preparedness and Response (ASPR), the National Institutes of Health (NIH), the Department of Homeland Security (DHS), the National Science Foundation (NSF), and other relevant PHEPR research funders should use funding requirements to drive needed improvements in the conduct and reporting of research on the effectiveness and implementation of PHEPR practices. Such efforts should include

- developing guidance on and incorporating into funding decisions the use of appropriate research methods;
- establishing guidelines for evaluations using different designs, evidence streams and concepts from emerging evaluation approaches, such as complex intervention evaluations; and
- developing reporting guidelines, including essential reporting elements in partnership with professional associations, journal editors, researchers, and methodologists.

RECOMMENDATION 7:

Support Workforce Capacity Development and Technical Assistance Programs for PHEPR Researchers and Practitioners

CDC and ASPR should work with professional and academic organizations that represent multiple disciplines to guide and support the creation of the workforce capacity development and technical assistance programs necessary to ensure the conduct of quality PHEPR research and evaluation and improve the implementation capacity of SLTT public health agencies. Such efforts should include

- developing a research training infrastructure and career development grants;
- providing training grants for PHEPR researcher and practitioner teams;
- providing ongoing technical assistance and peer networking for both PHEPR researchers and practitioners; and
- creating a training and certification program for CDC project officers and state preparedness directors.

RECOMMENDATION 8:

Ensure the Translation, Dissemination, and Implementation of PHEPR Research to Practice

CDC should use a coordinated implementation science approach to ensure that the evidence-based practice recommendations resulting from the PHEPR evidence-based guidelines group achieve broad reach and become the standard of practice of the target audience. Strategies to this end include

- incorporating evidence-based practices into the *Public Health Emergency Preparedness and Response Capabilities* guidance document;
- building evidence-based practices into the design of and funding decisions for the PHEP Cooperative Agreement;
- incentivizing and requiring SLTT public health agencies to test and evaluate new or adapted practices and embed evaluations into routine operations;
- disseminating evidence-based practices via CDC communication platforms (e.g., *MMWR*) and those of partnering organizations (e.g., ASTHO, NACCHO);
- leveraging PHAB accreditation and NACCHO's Project Public Health Ready.