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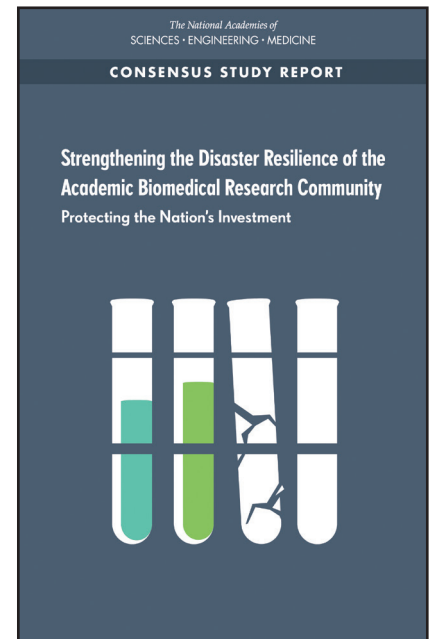
Strengthening the Disaster Resilience of the Academic Biomedical Research Community

Protecting the Nation's Investment

Each year, about \$27 billion is invested in life sciences research at our nation's academic research institutions. These institutions are hubs of employment, productivity, and scientific progress, driving economic development and generating knowledge that affects society in myriad ways.

Recent disasters, from hurricanes to cyber-attacks, have shown that investments of the federal government and of the many other entities that sponsor academic research are not uniformly secure. Such disasters can have enormous impacts on the safety and well-being of humans and research animals, as well as affecting career trajectories, scientific progress, and financial stability at the individual and institutional levels. They can also directly influence investigators' ability to meet grant goals and requirements, in turn influencing the metrics for and program outcomes of their sponsors.

Given the crucial contribution and substantial integration of these institutions into the national fabric, the National Academies of Sciences, Engineering, and Medicine convened an expert committee to develop recommendations and guidance to enhance the disaster resilience of the academic biomedical research community. The resulting report, *Strengthening the Disaster Resilience of the Academic Biomedical Research Community: Protecting the Nation's Investment*, outlines the committee's vision of a resilient academic biomedical research community and how this vision can be achieved, with a focus on the potential actions academic research institutions, individual researchers, and research sponsors can take.



A RESILIENT COMMUNITY

When disaster strikes the academic biomedical research community, the impacts can be felt at all levels: impacts on the safety and well-being of humans and research animals; disruptions to the careers of individual researchers; departure of research faculty and students; loss of data, samples, reagents, specialized equipment, and other materials; damage to buildings and physical infrastructure; interruptions to the institutional research mission; impacts on research funding and research sponsor investments; and so on.

Resilience—the ability to prepare for, absorb, recover from, and more successfully adapt to adverse events—should be both prioritized and institutionalized in the academic biomedical research community. To achieve resiliency, the academic biomedical research community can undertake actions needed to develop, sustain, and improve its ability to mitigate against, prepare for, respond to, continue operations during, and recover from disasters. The figure below shows that the goals of these efforts should be to protect human life, research animals, property, and the environment, as well as to maintain the integrity and continuity of the research.

THE ROLES OF INSTITUTIONS, INDIVIDUAL RESEARCHERS, AND RESEARCH SPONSORS

Institutions

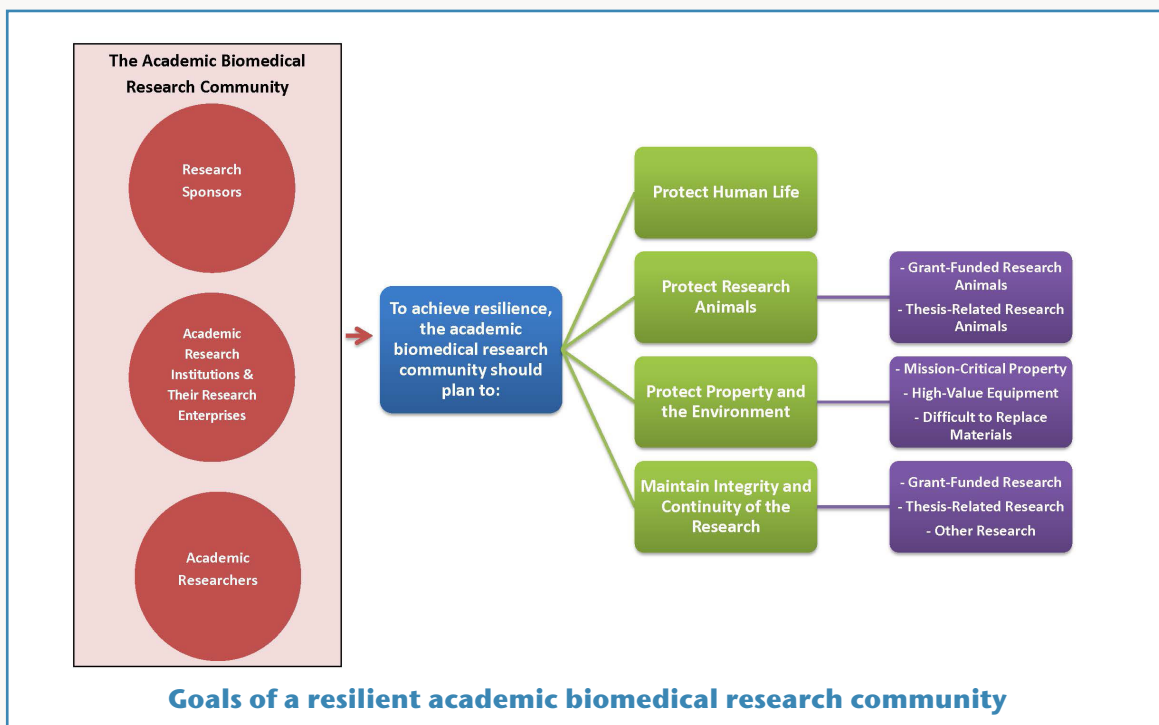
Resilience involves a long-term commitment that requires every stakeholder of the academic biomedical research community to accept responsibility and act

on it, from the individual researcher all the way up to the institutional leadership and the research sponsor. See the Box on the next page for an at-a-glance blueprint of action steps.

Support for disaster resilience for the research enterprise should come from a high level within institutional research leadership: a chief resilience officer for the research enterprise. This person should represent the interests of the research enterprise and integrate into the overall institutional disaster preparedness infrastructure, complementing the broader resilience efforts conducted by the institution.

The chief resilience officer should oversee a research enterprise planning committee and, in coordination with the institution-wide planning committee, should develop a family of plans encompassing the spectrum of prevention, protection, and mitigation actions, as well as response and recovery actions. Such plans should align with the National Preparedness System, the standardized emergency management principles and practices used by emergency management agencies to help promote resilience.

It is crucial that academic research institutions develop strong community partnerships with both private and public entities to facilitate planning, information sharing, and mutual assistance. Institutions should actively engage with key local, state, and national agencies to establish a mutual understanding of the unique disaster resilience efforts necessary for the research enterprise.



Other steps academic institutions should take include:

- implementing mandatory disaster resilience education and training programs for research students, staff, and faculty;
- developing an institutional financial investment strategy for disaster resilience efforts for the research enterprise;
- establishing performance-based standards to ensure that research facilities adequately protect experiments, research-related assets, and research animals; *and*
- conducting disaster resilience efforts to preserve the lives and prevent the suffering of research animals.

COMMITTEE'S BLUEPRINT FOR ADVANCING RESILIENCE

Academic Research Institutions and Researchers

- Designate a qualified, senior individual with oversight of disaster resilience efforts for the research enterprise
- Implement comprehensive and integrative disaster resilience planning efforts for the research enterprise
- Develop, enhance, and leverage local, state, and national partnerships
- Ensure the preservation of research data, samples, and reagents
- Implement mandatory disaster resilience education and training programs
- Improve the disaster resilience of animal research programs
- Develop performance-based standards for research facilities
- Develop an institutional financial investment strategy for disaster resilience efforts for the research enterprise

Research Sponsors and Stakeholders

- Convene a consortium of stakeholders to discuss efforts to enhance disaster resilience for the academic biomedical research community
- Recognize and engage the academic biomedical research community as a subsector of the Healthcare and Public Health Critical Infrastructure Sector

Individual researchers

Individual researcher–based efforts also are essential to achieving resilience. Researchers rarely consider what might happen to their research should a disaster occur. Principal investigators, who are in the best position to understand the specialized needs of their specific research, should play a pivotal role in safeguarding and preserving critical research data, samples, and reagents by actively engaging in disaster resilience planning with institutional leadership.

Researchers also can contribute to resilience by maintaining a culture of compliance and striving to engage in safe work practices in their day-to-day duties. This helps to minimize the cascading effects that typically follow a disaster.

Research sponsors

Sponsors of research should consider taking a more assertive role in protecting their research investments through resilience initiatives and development of policies to incentivize resilience at academic research institutions. High-level attention and coordination from research sponsors is needed to ensure that efforts to achieve resilience succeed.

A consortium of research sponsors (both federal and private), academic research institutions, professional associations, and private-sector stakeholders should convene to jointly discuss efforts that research sponsors can take to enhance the disaster resilience of the academic biomedical research community.

VITAL TO THE NATION

The academic biomedical research community provides essential health care and public health services that underpin American society, especially with respect to addressing emerging public health issues and chemical, biological, radiological, nuclear, and explosives threats on an emergent and long-term basis. The academic biomedical research community should be officially classified as a subsector of the Healthcare and Public Health Critical Infrastructure Sector.

Working to make the academic biomedical research community more disaster resilient through the development and implementation of risk-based protective programs and resilience strategies for infrastructure will enhance the nation's disaster resilience and protect the nation's biomedical research investment.

Committee on Strengthening the Disaster Resilience of Academic Research Communities

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CONCLUSION

Improving the disaster resilience of the academic biomedical research community will mean an unparalleled partnership across the emergency management and academic research sectors. Resilience is an imperative that should be sought throughout all sectors of American society. The committee's recommendations show that actors at all levels of the academic biomedical research community can take steps to promote such resilience.

To read the full report, please visit nationalacademies.org/DisasterResilientLabs

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