

## **ENVIRONMENTAL HEALTH RESEARCH AT NIEHS: CURRENT PRIORITIES AND PLANS FOR THE FUTURE**

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### **INTRODUCTION**

The National Institute of Environmental Health Sciences (NIEHS) is the premier environmental health sciences research institution in the world with both intramural research laboratories and extramural funding programs. As such, NIEHS and its priorities have considerable influence on environmental health research conducted in the U.S. and abroad. In late 2011, NIEHS embarked on a new strategic plan to capture the future research potential in environmental health and prioritize Institute directions for the next 5 years.

### **MATERIALS AND METHODS**

The strategic planning process utilized four distinct steps:

1. A public, open-access website to acquire input from a broad base of constituents to generate "Visionary Ideas" for the strategic plan. This process permitted all interested parties, from employees to grantees to the general public, to submit ideas for the strategic plan. The website also allowed visitors to nominate attendees for the next step, an in-person community workshop. The ideas generated through the website were cataloged and provided to the attendees of the community workshop.
2. An in-person Strategic Planning Stakeholder Community Workshop, held over 3 days with nearly 200 participants, including a mixture of scientists, public health policy, regulatory experts, management of scientific research, communication experts, and non-scientific staff. Utilizing "Open Space Technology" participants quickly filled a blank agenda with 124 topics. After consolidating topics, attendees held breakout discussions and produced reports of highlights and recommendations. A total of 97 discussion groups met and submitted reports. These reports were then collated and clustered such that strategic themes emerged from the wide variety of topics. Participants then had the opportunity to vote for the reports that they felt were crucial to the strategic plan. Thirteen reports received the most votes, and remaining topics were clustered around the primary 13 topics, forming the final 8 themes that best supported the mission of the strategic plan. All 97 discussion group reports and subsequent 13 topics continue to be available on the NIEHS Strategic Plan website.
3. A second, in-person meeting of approximately 50 stakeholders who represented the broad expertise of environmental health science, held over two days, to review all the compiled input from the website and the 97 published reports from the first in-person community workshop. This group of participants drafted a mission statement, a vision for the Institute, and supporting themes that would comprise the actual content of the strategic plan. Public review and comment were also offered on drafts of these items on the NIEHS website.
4. Using the mission, vision and themes, Institute leadership spearheaded the process of developing strategic goals by leading divisional retreats to obtain broad-based input. All strategic goals were collected and coalesced into a single list, from which Institute leadership organized and developed a set of 11 institutional goals.

Transparency was a primary consideration throughout the strategic planning process. All documents were (and still are) made available on the public NIEHS website, the public was afforded opportunity for input, and updates at all

stages were provided to the National Advisory Environmental Health Sciences Council, an oversight body for the Institute.

## RESULTS AND DISCUSSION

The lengthy Strategic Planning process resulted in the following:

1. The mission of the National Institute of Environmental Health Sciences is to discover how the environment affects people in order to promote healthier lives. This mission statement provides a concise statement of why the Institute exists, what it works to achieve, its purpose and unique identity. It describes how the Institute will serve those affected by its work and defines the Institute's values and aims.

2. The vision of the National Institute of Environmental Health Sciences is to provide global leadership for innovative research that improves public health by preventing disease and disability from our environment. This vision statement tells us where the Institute is going as an organization. It creates a mental image of where the Institute wants to be in the future, and is a source of inspiration, setting a standard to strive toward.

3. Six themes that support the Institute's mission and vision:

*a. Fundamental Research:* Understanding the biology that defines basic mechanisms of response to environmental stressors and the implications for human health.

*b. Exposure Research:* Understanding how the complex nature of exposures, at the individual and population levels, contributes to health outcomes.

*c. Translational Science:* Transdisciplinary environmental health science to inform individual, clinical, and public health decision making to improve health.

*d. Health Disparities and Global Environmental Health:* Research to understand environmental contributors to global health and health disparities.

*e. Training and Education:* Developing and retaining a sustainable pipeline of environmental health professionals across a range of related disciplines including fundamental science, exposure science, translation, policy, and outreach through efforts in education, training, and career development; raising the level of environmental health literacy of the general population and all other NIEHS stakeholders.

*f. Communications and Engagement:* Advancing translation and dissemination of scientific knowledge on the role of the environment and human health; pursuing appropriate and effective means of engagement of the broad range of institute stakeholders in environmental health research and public health promotion.

4. Two cross-cutting themes that serve as overarching ideas that traverse all the other themes:

*a. Knowledge Management:* Environmental effects on health and disease are complex, and understanding these effects requires an integrated and comprehensive approach to data management. The pace of data generation in environmental health sciences has outstripped the existing infrastructure for information acquisition, management, analysis, visualization and dissemination. The various issues around information/data/knowledge management comprise an overarching issue with implications applicable to all the Strategic Planning Themes.

*b. Collaborative and Integrative Approaches:* An overarching theme identified during the NIEHS strategic planning process is the importance of collaborative and integrative approaches to environmental health sciences. Adverse

effects leading to disease occur at multiple points throughout complex systems, often from multiple exposures, and across various life stages. The research enterprise for environmental health sciences needs to be positioned to exploit all relevant disciplines in a coordinated, integrated fashion to solve these complex problems. Environmental health scientists need to be enabled to work across a wide array of fields: cell and molecular biology, structural biology, biochemistry, genetics, pharmacology, toxicology, epidemiology, biostatistics, behavioral sciences, engineering, and many others. Systems biology, computational biology, and other promising new approaches are dependent on interdisciplinary collaborations. In addition to interdisciplinary approaches to fulfilling its science mission, NIEHS must also work to develop innovative collaborations with sister agencies, communities, and other partners to effectively translate this knowledge to inform prevention and interventions, as well as to guide stakeholder decision making at all levels.

By seeking and accepting input from a broad array of internal and external stakeholders, NIEHS is poised to confront modern and future challenges in environmental health with its new strategic plan.

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