

Strategies for Setting a National Research Agenda That Is Responsive to Community Needs

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Setting a national environmental health research agenda requires broad public input, including that from leading scientists, health care professionals, and communities. Contributions from these diverse constituencies are essential to formulating a research and education strategy that both advances our understanding of the causes and mechanisms of environmentally related diseases and translates such findings into effective prevention and clinical applications to protect those most affected by adverse environmental exposures. Given the increasing number of individual researchers working with communities to address environmental health needs during the past decade, it is also essential for research institutions to foster relationships with communities to understand and respond to their unique public health needs, as well as to communicate research advances in a manner that is both understandable and culturally appropriate. To achieve broad public input and to foster community–university partnerships, the National Institute of Environmental Health Sciences (NIEHS) supports various workshops, roundtables, and advisory groups. In particular, the NIEHS finds Town Meetings to be a successful model for bringing academic researchers together with community residents, state and local departments of health, and community-based organizations to foster greater awareness of community needs, public health needs, and environmental health science research. Since 1998, the NIEHS has supported 16 Town Meetings across the country. In this article we highlight the major outcomes of these meetings to demonstrate the effectiveness of this mechanism for enhancing cooperation among researchers, community residents, and public health officials with the goal of improving public health and setting a national research agenda. *Key words:* community partnerships, environmental health, health disparities, outreach strategies, prevention research, public health, research agenda, Town Meetings, translational research. *Environ Health Perspect* 111:1855–1860 (2003). doi:10.1289/ehp.6267 available via <http://dx.doi.org/> [Online 5 August 2003]

Setting a national environmental health research agenda requires involvement from a broad array of constituencies, including leading scientists, health care professionals, and communities. Contributions from these diverse groups are essential to both formulating a research and education strategy that advances our understanding of the causes and mechanisms of environmentally related diseases and translating such findings into effective prevention and clinical application to protect those most affected by adverse environmental exposures.

During the last decade, there has been greater community participation in the research process. In part, this change has been brought about by funding mechanisms of federal and private institutions that support biomedical research (O'Fallon and Dearry 2001; Shepard et al. 2002). These granting institutions encourage grantees to develop partnerships with communities in order to have a greater impact on the overall public health of the community and to ensure that research is responsive and applicable. Funding and research institutions must be proactive in building partnerships with communities so that research program development is congruent with the concerns and public health needs of communities (Bonham and Nathan 2002;

Kone et al. 2000). These partnerships are essential for researchers and policy makers to communicate clearly with the general public. This two-way dialogue is a fundamental prerequisite to development and implementation of effective research and intervention efforts that delineate and ameliorate environmental health risks in disadvantaged communities.

Recent studies of community-based participatory research (CBPR) have enumerated several key principles (Freudenberg 2001; Israel et al. 1998; O'Fallon and Dearry 2002). Such work has substantiated the positive outcomes from research partnerships established with communities (Israel et al. 1998; Kinney et al. 2000; Krieger et al. 2002; Northridge et al. 1999; O'Fallon and Dearry 2002). If a project is truly collaborative, all partners will benefit. Communities benefit from policy change, improved health, capacity building, and jobs created through the project. Researchers benefit with increased participation and retention of community residents in the project and enhanced experimental design as new and different environmental concerns are identified. Local and state departments of health benefit from data collected and an overall increased community awareness of environmental health issues. Funding agencies benefit from collaborative partnerships because CBPR often produces

policy and regulatory change and, in turn, improved public health (Gilliland et al. 2001; O'Fallon and Dearry 2002; Shepard et al. 2002). Community–university partnerships are thus key and advantageous to all partners.

In the same way that federal agencies promote community–university partnerships, these same agencies should strive to develop closer ties with communities they serve. These partnerships can be useful in setting new research priorities and developing research programs that are aligned with prevailing public health concerns. Establishing these ties can be challenging and often requires multiple creative strategies to initiate and cultivate them.

The NIEHS Commitment to Communities

For more than a decade, the National Institute of Environmental Health Sciences (NIEHS) has established itself as a leader in promoting the importance of collaborations between researchers and communities. As a federal agency with a mission emphasizing disease prevention, the NIEHS has become a proponent of community–university partnerships to address community health concerns so that communities have an active role in all stages of research (Olden 1993; Shepard et al. 2002). The NIEHS has long recognized the need to conduct basic science research in tandem with effective and culturally appropriate translational research activities, including CBPR, outreach, and education (O'Fallon and Dearry 2001, 2002).

In 1993, the NIEHS developed Environmental Justice: Partnerships for Communication, the first of its translational research programs. The environmental justice (EJ) program fosters collaborative relationships among environmental health scientists, communities, and health care providers to address an environmental health concern that is shared among the partners. Currently, the NIEHS supports more than 20 EJ projects

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that address environmental health issues such as exposure to pesticides, lead and other heavy metals, and particulate matter as well as health outcomes such as asthma, developmental disorders, and lupus.

For example, the Environmental Health Coalition (EHC), a community-based organization in San Diego, California, has partnered with investigators at the Environmental Health Sciences (EHS) Center at the University of Southern California and with Logan Heights Health Center to address environmental health concerns in Barrio Logan, a community with no zoning laws. Because industrial operations can take place next to homes, exposure to hexavalent chromium, a toxic air pollutant, from chrome plating shops has been of greatest concern to community members (Forbis and Baker 2002). Through this collaboration, the EHC was able to collect substantial data to demonstrate exposures in excess of legal limits. As a result, the city closed a local plating company.

Soon after establishing an EJ program, the NIEHS created the CBPR program, which emphasizes research and intervention in economically disadvantaged and/or underserved populations adversely affected by environmental contaminants. Projects build upon a functional relationship between researchers and community members. The program is intended to foster refinement and testing of scientifically valid exposure reduction intervention methods and to strengthen the participation of affected communities in this research effort.

Funded by a CBPR grant, researchers at Oregon Health Sciences University are examining pesticide exposures in migrant families in collaboration with their community partner. The research process has included both qualitative research methods with members of the community and quantitative approaches to measure pesticide dust residues in homes, biomarkers of pesticide exposure, and effects on health, such as neurobehavioral dysfunction in children. Researchers developed an education video and assessed its value as a culturally appropriate intervention strategy at the Oregon Child Development Coalition's Migrant Head Start programs statewide and to other Head Start, legal, education, and health centers nationwide (McCauley et al. 2001). They have also developed a test to evaluate the neurotoxic effect of pesticides on children of migrant farmworkers.

In 1996, the NIEHS initiated a community outreach and education program (COEP) within its EHS centers as a mechanism to enhance interaction between researchers and communities. COEPs translate cutting-edge research into knowledge that can be applied to public health, and communicate community environmental health concerns to center investigators. COEPs conduct activities such

as hosting community forums, developing brochures, creating environmental health curricula for inclusion in kindergarten through 12th-grade classes, offering professional development to health care professionals, and facilitating interactions between communities and the research center. COEPs often take the lead in organizing NIEHS Town Meetings.

Other NIEHS programs that emphasize community–university partnerships include Centers for Children's Environmental Health and Disease Prevention Research, Health Disparities Research, and the Superfund Basic Research Program (SBRP). Together, these efforts aim to ensure that affected communities have a voice in identifying issues and prioritizing their concerns, and a role in conducting research and intervention studies in tandem with academic scientists.

Setting a National Environmental Health Research Agenda

The NIEHS uses various strategies—including workshops, retreats, community advisory groups, and Town Meetings—to develop a national environmental health research agenda that is responsive to community concerns. Each year the NIEHS supports a variety of workshops and roundtables to assess new research opportunities in environmental health. These small meetings are targeted toward leading researchers and policy makers in a particular field of environmental health research. Similarly, the NIEHS hosts leadership retreats for researchers, representatives of disease advocacy groups and community-based organizations, health care and public health professionals, and program staff. These retreats are used to identify new developments in EHS, steps that might be taken to advance this field more rapidly, and the role the NIEHS can play in such endeavors.

Recently, the NIEHS established the Public Interest Liaison Group (PILG) as another mechanism to seek input from the community and to enhance communication and outreach. Recognizing that those affected by potential environmental diseases have a unique and important perspective to share, the NIEHS believed it would be important to include these groups in the planning process. The PILG represents a variety of disease groups (e.g., asthma and other respiratory diseases, breast cancer, Parkinson disease, Alzheimer disease, autoimmune disorders, birth defects, lead poisoning, learning disabilities), as well as groups that represent specific at-risk populations (e.g., children's health, women's health, minorities, populations of low socioeconomic status). NIEHS staff and PILG members discuss specific research areas and identify research directions that PILG members believe are important to pursue.

To understand what environmental health issues are of importance to communities and to increase public awareness about EHS, the NIEHS hosts Town Meetings and brainstorming sessions at locations across the United States. Input from these meetings is used to further develop and modify research, communication, and education programs at the NIEHS.

Through this array of planning approaches, the NIEHS obtains advice and input from a broad spectrum of researchers, health care professionals, advocates, policy makers, and community members. This guidance is essential for successful development of research and education strategies that use state-of-the-science methodologies to improve community public health.

Town Meetings

The NIEHS finds Town Meetings to be an effective strategy to ensure that affected communities have a voice in identifying environmental health research priorities. These meetings are consistent with recommendations of a review of the National Institutes of Health (NIH) by the National Academy of Science's Institute of Medicine, titled *Scientific Opportunities and Public Needs: Improving Priority Setting and Public Input at the National Institutes of Health*. The report stated, "NIH should engage the public to a greater extent in informing the process by which NIH sets its research priorities" (Institute of Medicine 1998). Since 1998, the NIEHS has supported 16 Town Meetings across the country that have addressed a range of environmental health issues (Table 1).

The purpose of these Town Meetings is to bring together the lay public interested in public health and the environment, state and local health professionals, federal government representatives, state and local government officials, academicians, environmental health professionals, and advocacy groups. The meetings provide a platform for an open dialogue to establish better coordination among the health professionals working on various environmental issues, such as community exposures, industrial exposures, and special-case "site" exposures. These meetings also provide an opportunity to promote local and state media coverage of environmental health issues to broaden public awareness and understanding. Most important, through these open discussions, NIEHS leaders learn about the issues that are important to communities across the nation.

Town Meetings are planned to allow the greatest participation of community members and are structured to properly represent community issues such as air pollution and respiratory disease, lead poisoning and children's health, breast cancer and the environment, or

oceans and human health. Therefore, a local NIEHS EHS research center, a public interest group such as the American Lung Association, a community organization or other interested group will organize the Town Meeting. Recognizing that the host organization knows its community best, the NIEHS offers advice only on the format for the meeting based on what has worked best over the past few years and provides the host with financial support for promoting the event, reserving meeting space, and covering travel costs for invited speakers. The NIEHS works with the host to answer questions about organizing the meeting and selecting a topic, but the final format and content are determined by the host. Usually, the host establishes a diverse planning committee of researchers, health care providers, community members, and policy makers to develop the agenda.

To date, the most successful Town Meeting format is a day-and-a-half meeting that includes a scientific symposium and an open forum for community members. The full meeting is open to community involvement, although the most active participants during the scientific symposium are researchers, health care providers, and public health officials who want to hear about the latest research findings in this particular field. The open forum is designed specifically to encourage and facilitate comments and questions from residents. To this end, the forum is set at a time and location that allows for the greatest level of community participation, and panelists give brief comments on research, policy, and public health before the floor is opened to the public. The expert panel addresses the comments and questions raised. Sometimes the host organization will have a local or federal politician, a popular local television news anchor, or a communications expert facilitate the meeting. This strategy often results in a more interesting meeting and attracts a larger audience.

The NIEHS director and several NIEHS staff members always attend the Town Meetings to listen to the issues raised and to answer any questions posed to the Institute. The director always opens the Town Meeting by explaining the purpose of the event and emphasizing the importance that the NIEHS places on community input, and participates fully in the discussions.

In addition to helping the NIEHS set a national research agenda in environmental health, there have been many noteworthy outcomes. These outcomes can be classified into *a*) community impact, *b*) new research, *c*) new outreach, *d*) education, and *e*) public health and policy impact. The following sections highlight some of the major outcomes of these Town Meetings.

Community Impact

An immediate outcome of a Town Meeting is increased awareness of environmental health research carried out by NIEHS-funded centers and grantees. Citizens learn of the resources a center can provide to address their environmental health concerns. In some instances, it breaks down barriers, erases misconceptions, and may help enhance the process of establishing trust between researchers and communities.

Johns Hopkins University. After the Baltimore Town Meeting held in 1999, researchers at the EHS Center at Johns Hopkins University (JHU) noted several immediate outcomes. Center investigators were able to begin building increased trust with Baltimore residents. In addition, residents soon saw the potential of the center to address the EJ concerns they have, primarily regarding indoor and outdoor pollutants, contaminants in schools, and building demolitions. As a result of the Town Meeting, center researchers have been able to work with community members to develop exposure assessment projects.

University of Washington. Two important outcomes resulted from the Town Meeting hosted by the Center for Environmental and Eco-genetics at the University of Washington in Seattle in 2000. Immediately after the meeting, the EHS Center developed the Health Justice Network, a computer listserver designed to disseminate information on EJ issues, including presentations, trainings, grant opportunities, and meetings. In addition, after the meeting, the center was approached by a Native-American community to help them conduct a study on reproductive health effects they believe may be related to the fish they eat.

University of California at Berkeley. The SBRP at Berkeley was able to engage a different segment of the community as a direct result of their Town Meeting in 1999. After attending the Town Meeting, the Alameda County Director of Public Health agreed to participate in the SBRP external advisory committee. Participation by the local health department has brought a greater EJ focus to the committee, which has enhanced the overall program.

Vanderbilt University. After the Town Meeting in 1999, the community recognized the EHS Center at Vanderbilt University as a valuable resource. Consequently, the EHS Center was able to establish partnerships quickly with the Tennessee Pollution Prevention Partnership, the Tennessee Arts and Sciences Consortium, the Middle Tennessee Poison Center, and various community environmental advocacy groups. In addition, a variety of local workgroups have asked the center to provide personnel for assistance. The center also began offering services to community members by making available general environmental health information, center-sponsored entrance into Vanderbilt's library network, and subscriptions to *Environmental Health Perspectives*.

University of Illinois at Chicago. Investigators at the University of Illinois at Chicago established a collaboration with the Grand Boulevard Asthma Coalition after hosting their Town Meeting in 1999. As part of this partnership and in response to the request of a past Chicago commissioner of public health, a collaborative team formed the Public Housing Environmental Task Force. This task force is composed of representatives from communities, community organizations, city officials, the university, and federal agencies. The task force was instrumental in the adoption of integrated pest management strategies throughout the Chicago public housing system by the Chicago Housing Authority.

New Research

Sometimes community–university partnerships that emerge from hosting a Town Meeting develop into successful research projects.

Table 1. Location, date, and topic of Town Meetings.

Location	Date	Theme/topic
Piscataway, New Jersey	September 1998	Urban environmental health
Nashville, Tennessee	November 1998	Environmental health implications of pollution
Cincinnati, Ohio	January 1999	Neighborhood environmental health
Berkeley, California	February 1999	Children's environmental health
Baltimore, Maryland	May 1999	Health disparities
Chicago, Illinois	July 1999	Health disparities
Seattle, Washington	September 2000	Pacific Northwest environmental health issues, e.g., farming, seafood
Houston, Texas	October 2001	Neighborhood environmental health, industrial pollution
Iowa City, Iowa	November 2001	Concentrated animal feeding operations (CAFOs)
Los Angeles, California	December 2001	Southern California environmental health issues, e.g., transportation, air pollution
El Paso, Texas	February 2002	Children's environmental health
Marin County, California	October 2002	Breast cancer
San Antonio, Texas	January 2003	Neighborhood environmental health
Miami, Florida	February 2003	Oceans and human health
Syracuse, New York	April 2003	Particulate matter and health
Chicago, Illinois	June 2003	Particulate matter and health

Of the Town Meetings hosted to date, three of the research institutions have received some form of grant support for research projects directly resulting from a Town Meeting.

Johns Hopkins University. A center investigator in partnership with a local community organization received an NIEHS CBPR grant to examine health effects of exposure to debris from building demolition that is taking place in neighborhoods of lower socioeconomic status surrounding the university. The partnership and the research questions were established as a result of the Town Meeting. Findings from this project are affecting policy related to the demolition of homes in Baltimore.

University of Cincinnati. At the Town Meeting, EHS Center investigators were introduced to, and later partnered with, officials from the City of Cincinnati Office of Environmental Management to address concerns of lead exposure from paint dust on city sidewalks, and to assess the efficiency of current dust removal procedures. They received a 1-year grant from the U.S. Department of Housing and Urban Development for their project, titled Control of Lead in Sidewalk Dust Derived from Exterior Paint.

University of Illinois at Chicago. Investigators at this institution have been successful in converting the outcomes of the Town Meeting into grant support; four projects have been funded by the NIEHS and U.S. Environmental Protection Agency (EPA). Issues raised at the meeting included lead, poor housing conditions, pollution, violence, environmental effects on asthma morbidity, and the need for training and employment opportunities in underserved populations. Partly in response to the Town Meeting, the Grand Boulevard Asthma Coalition adopted public housing as its major focus, specifically the Robert Taylor Homes. University investigators, in partnership with the coalition, received a small grant from the U.S. EPA to train peer educators to screen 100 families with asthma, examine environmental effects on asthma, and devise intervention strategies. Results from this initial project were used to successfully apply for an NIEHS community-based prevention/intervention research award to examine the effects of peer education on asthma, lead, and safer methods of pest control in approximately 300 families residing in Chicago public housing. In support of this effort, the Chicago Housing Authority successfully applied for U.S. EPA funding to train eight additional peer educators.

Over the past 2 years, the task force created by university investigators has been working with the Chicago Housing Authority on maintenance and safer construction of new public housing structures. Demolition of older structures raised many concerns about possible health effects. These concerns led to an NIEHS

grant award to examine the impact of demolitions on respiratory function.

New Outreach

Because a major goal of the Town Meeting is to increase community awareness and to establish strong community–university ties, a crucial outcome is often new methods of working with the community.

University of Cincinnati. After the Town Meeting the center, with institutional support, established a community health and environment research center to facilitate community–university environmental health research activities. This center, named In My Back Yard (IMBY), has worked with various communities since its inception. It provided technical support to the South Side Community Action Association in Southfield, Ohio, when they were conducting a survey of 1,035 households. IMBY has also provided continuing education to nurses in the city health department. IMBY and the University of Cincinnati Department of Environmental Health are leading a coalition of nonprofit organizations and government agencies in the development and implementation of the Over-the-Rhine Smart Streets: A Lead Reduction and Environmental Job Training Demonstration Project. IMBY has helped develop a training video and established an EJ and health disparities seminar series at the university's Department of Environmental Health. IMBY has also responded to requests for assistance from communities in Ohio, Louisiana, and Mississippi.

Vanderbilt University. Building upon the momentum generated by the Town Meeting, the center at Vanderbilt initiated a new community forum series to strengthen partnerships with the community. The community forum seminar series focuses upon environmental health issues of particular concern to local and state communities. To promote community participation and interaction in the series, ample time is always set aside for audience members to discuss topics with presenters. The center has hosted six seminars addressing topics from cancer to herbal medicines. Presentations are given by center investigators as well as invited speakers from the NIH, NIEHS, Tennessee Department of Environment and Conservation, and Vanderbilt faculty.

Education

In the process of increasing awareness about environmental health issues, some universities develop curricula that are appropriate for the communities with which they are working.

University of Washington, Seattle. As a result of the Town Meeting, the EHS Center was able to establish and sustain two very important educational projects. To involve youth from around Washington State in the Town Meeting, the center worked with high

school teachers in the towns of Yelm and Wenatchee to set up a video conference project titled Youth Network for Healthy Communities. In the first year, 18 middle and high school teachers worked with students on environmental health issues in their communities. The students then presented their findings to experts at the University of Washington via the statewide video conference network. Students researched such diverse topics as Superfund sites, health effects of wildfires, and environmental impact of diesel power generators. The project has been a great success, and video conference sessions are being offered again this academic year.

In response to expressed needs at the Town Meeting, researchers at the University of Washington's Center for Children's Environmental Health and Disease Prevention Research developed a curriculum in a community-based project in the Yakima Valley to raise awareness of means of reducing pesticide and chemical exposures in agricultural settings. The University of Washington plans to train teachers at Head Start and Heritage College in this curriculum, to help reduce pesticide exposure to children who live with farmworkers. Materials developed will be shared with partners in western Washington, especially El Centro de la Raza and Education Service District 189 (ESD 189). El Centro de la Raza is an organization that provides culturally appropriate social services for the Latino community in Seattle and western Washington. ESD 189 is located in an agricultural community, Mount Vernon, with a large proportion of farmworker families. Both El Centro and ESD 189 have previously turned to the University of Washington for more specialized educational materials for their bilingual constituents.

University of Cincinnati. After hosting the Town Meeting, outreach staff at the EHS Center have had opportunities to develop new and use existing environmental health curricula. IMBY coordinated development and conduct of a six-part continuing education program for the nurses of the Cincinnati Health Department (CHD). Speakers included members of the Center for Environmental Genetics, Department of Environmental Health researchers and clinicians, deputy health commissioners of the CHD, and the principal investigator of the local NIEHS EJ project.

Learning Exchange for Genetic Disease Solutions (LEGENDS) is the adult education curriculum developed by the COEP of the Center for Environmental Genetics. The curriculum includes six chapters with 24 teaching modules, covering *a*) environmental health, *b*) human genetics, *c*) genes and disease, *d*) environmental genetics, *e*) genetic testing, and *f*) human genome research. As a result of the Town Meeting, the LEGENDS program

was able to make contacts with local health agencies and community organizations, establishing collaborations that later led to the participation of COEP staff in educational programs sponsored by state and national organizations. On the local level, the Director of Environmental Health Programs at the CHD became acquainted with the LEGENDS program at the regional Town Meeting and symposium. Recognizing the relevance of the curriculum to his staff, the director requested presentations to his employees. In May 1999, the Human Genetics and Gene/Environment Interactions module was presented to his staff; in May 2001, the Human Genetics and Toxicogenetics module was presented.

Johns Hopkins University. After the Town Meeting, JHU developed a course on environmental health in community outreach for the 1999 fall semester. The course, titled Special Studies Course of Environmental Health in Community Outreach and Education, continues to be offered each semester. The class meets weekly and involves presentations from members of many community organizations, with which working relationships have been developed since the Town Meeting. Many students from the JHU Bloomberg School of Public Health pursuing their master's degree take this course and write an essay as part of the graduation requirement. Active involvement of community members in this course has helped link the efforts of community outreach with the mission of the school.

University of Medicine and Dentistry of New Jersey. After hosting a Town Meeting in 1998, the COEP at the EHS Center initiated a collaboration with the COEP at Vanderbilt University. This partnership later evolved into a larger NIH-funded collaborative project with seven other COEPs titled Environmental Health Science Training Education Program to train educators on select environmental health curricula.

Public Health and Policy Impact

Anticipated outcomes of Town Meetings include public health and policy impacts. Such results may come about through increased awareness of a topic discussed at the Town Meeting, from research resulting from the Town Meeting, or a combination of the two.

University of Iowa. The EHS Center at the University of Iowa hosted a Town Meeting on concentrated animal feeding operations (CAFOs), an important topic among rural Iowans. At the same time, researchers at the university were working collaboratively with researchers from Iowa State University on a larger report addressing adverse health effects from CAFOs. After the Town Meeting, a report was submitted to the state governor and the director of the Iowa Department of Natural

Resources. Investigators recommended various environmental standards, including ambient air quality standards for hydrogen sulfide, ammonia, and odor at the property line of CAFOs and at neighboring residences or public use areas. Besides air quality, the report also addressed emerging issues such as water quality, antibiotic resistance, greenhouse gas emissions, statewide siting and spatial planning, and livestock epidemic and carcass disposal. Several recommended standards became established state policy.

Johns Hopkins University. Research on the demolition of homes clearly demonstrated the need for proper measures to reduce exposures from dust and pests. Consequently, greater enforcement of existing policies has been taking place in Baltimore.

University of Cincinnati. The research project, Control of Lead in Sidewalk Dust Derived from Exterior Paint, that resulted from the Town Meeting was instrumental in emphasizing the importance of addressing lead exposures in the community. At the conclusion of the research study, the Cincinnati Office of Environmental Management developed a comprehensive lead policy detailing each department's role in reducing lead risk. In addition, the Cincinnati City Council is in the process of adopting a new city lead ordinance, the city health department is preparing a lead risk reduction plan for presentation to city council, and the state has just adopted a new set of lead regulations that will make it simpler for property owners to control lead hazards on their property.

Lessons Learned and Conclusions

The NIEHS employs an array of strategies to engage input for setting its research agenda. Town Meetings are an important and effective means for providing senior leadership at the NIEHS the opportunity to hear from communities across the country about environmental and public health issues that are of greatest importance to them. Town Meetings also provide a forum for the NIEHS to encourage increased interaction among communities, universities, health care professionals, advocacy groups, and policy makers.

The NIEHS has learned several key lessons about helping organize Town Meetings, because some have been more successful than others.

- The meeting must be convened in a location that is both convenient to and comfortable for the community. Town Meetings that had greatest community participation were held in the evening at a building accessible by public transportation and within the community (e.g., a church or community center). It is evident that local residents are passionate about the condition of the environment in which they live, and they welcome opportunities to

talk with experts about their concerns. Therefore, efforts need to be made to facilitate their participation.

- Controversial environmental health topics are encouraged. Meetings that avoided such topics did not have as great an impact at the local level. When a controversial theme is selected, it is important to ensure that both sides of the issue are presented.
- There should be a minimum amount of lecturing and a maximum amount of audience participation. Free-flowing and open discussion is a key component to a successful Town Meeting.
- The press (both print and television) can play a very important role in a successful Town Meeting by helping publicize the event and then reporting about it.
- The final agenda must be decided by the host organization. The NIEHS can provide guidance on what has been successful in the past, but a format that worked in one community may not be appropriate or necessary for another.

Positive outcomes from these Town Meetings have been used to guide strategic research and education program development. For example, Town Meetings in Baltimore and Chicago provided greater insight into health disparities and the importance of the social environment for human health. These meetings assisted in development of the NIEHS Health Disparities Research program and the trans-NIH Centers for Population Health and Health Disparities. Finally, the built environment has become a very important issue as a result of the Chicago and Baltimore Town Meetings. The NIEHS recently hosted a conference on the built environment as a result of listening to community concerns and has integrated the concept into new and reannounced programs (Srinivasan et al. 2002).

Other examples of how Town Meetings have shaped program development include modification of the children's environmental health centers, establishment of breast cancer and the environment centers, and centers for oceans and human health. In the reannouncement of the Centers for Children's Environmental Health and Disease Prevention Research Program, there will be a larger translational component to ensure that research is being communicated to communities in an appropriate and understandable way. The Breast Cancer and the Environment Program will have a community outreach and translation core as a means to communicate research results to the community, which includes health care professionals, advocacy groups, and policy makers. Finally, input from Town Meetings has helped shape the establishment of Centers for Oceans and Human Health.

In the end, it is imperative that consumers be more intimately involved and informed

about science and its implications. That is why the NIEHS strongly supports strategies such as Town Meetings as a means to ensure that its science is responsive to the needs of all communities.

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