



Communication Research in Environmental Health Sciences: Environmental Health Literacy

September 22-24, 2014

NIEHS Building 101, Rodbell Auditorium • Research Triangle Park

Presentation Abstracts

Session 1: Setting the Stage for the Meeting

Defining EHL in Context of NIEHS' Commitment to Community Engagement

Liam O'Fallon, *NIEHS*

This presentation places the need for communication research and environmental health literacy in the context of Partnerships for Environmental Public Health (PEPH) program, and the institute's commitment to community-engaged research and communication. In addition, the presentation will provide a working definition of environmental health literacy and posit a model for measuring stages of comprehension and literacy. The NIEHS established PEPH to promote and coordinate a network of diverse partners with a shared interest in increasing the impact of environmental public health research. A goal of PEPH is to stimulate new and strengthen existing approaches in research, communication, training, and evaluation.

NIH's Health Literacy Efforts: Agency Practices and Extramural Research Projects

Bill Elwood, *National Institutes of Health- Office of Behavioral and Social Sciences Research*

This presentation describes the NIH commitment to Health Literacy and the programs that have been supported by different Institutes and Centers. It will note outcomes from those efforts and the implications for environmental health literacy.

Outside Influences on Environmental Health Literacy

Symma Finn, *NIEHS*

This presentation provides an overview of the cultural, technological, scientific, and regulatory influences on how the public perceives and understands the connections between environmental factors and human health. The presentation covers the social and educational movements since the 1970s that have influenced public understanding of environmental health risks, the regulatory changes that established specific levels of concern relative to chemical exposures, and the technological developments and new communication modalities that have emerged that expanded how environmental risk is communicated. This talk situates existing environmental health risk messaging within the larger context of influences.

Defining Environmental Health Literacy Together

Marti Lindsey, *University of Arizona*

This presentation describes a collaborative effort to begin defining environmental health literacy. A problem with environmental health literacy among the American public is indicated by the mismatch between the public's misperceptions of risk and the complexity of environmental health information. NIEHS has embraced the concept of Environmental Health Literacy as being vital to its goal of improving public health by preventing disability and disease from our environment. There were struggles, over many years, in the field of health literacy, including dealing with multiple definitions of health literacy, inconsistent application of these definitions, disagreement about what skills are involved, and lack of clarity over whether it is an individual's capacity or the capacity of groups. The Arizona/ New York project utilized loosely structured interviews with 34 environmental health professionals in various EH occupations to develop a list of skills and knowledge identified as being necessary for environmental health literacy. Suggestions to EH information providers was compiled from the interviews. The list of knowledge items and skills were compiled into a structured survey, and ranked by a diverse group of 200 environmental health professionals. Statistical analysis identified areas of significant agreement concerning knowledge elements and a few skill elements that can be used to develop a definition of EHL. This work sets the stage for further research that includes developing comprehensive measures, identifying the consequences of low versus high EHL, and implementing methods of improving EHL.

Influence of the Media on Understanding of Environmental Health

Katherine Rowan, *George Mason University*

This presentation offers an analysis of effective work with media to share information about the harmful effects of climate change. The analysis is guided by the CAUSE Model for science and risk communication (e.g., Rowan, et al., 2009). In brief, the model explains that when scientists strive to share information about climate change, or any environmental hazard, their efforts are apt to be challenged by a predictable set of five tensions. These five challenges are indicated by the letters in the heuristic, C – A – U – S – E. The “C” in CAUSE refers to lack of confidence. Scientists sometimes lack confidence in reporters, and reporters and the community stakeholders question scientists' motives for communicating. While these barriers are not easy to overcome, there are steps for earning confidence from key stakeholders, which this presentation will describe. The remaining letters in the model, A – U – S – and E, each identify frequent tensions scientists and science communicators face. Briefly, the “A” identifies steps for creating awareness, which include best practices for gaining attention and conveying warnings. The “U” taps research on deepening understanding such as steps for explaining a single key term, helping people envision a complex structure or process, and helping stakeholder audiences consider and rebuff common misconceptions. The “S” stands for satisfaction with solutions and describes conditions under which stakeholder groups come to agree on policies for addressing environmental harms. The “E” indexes enactment: often merely agreeing that a policy makes sense does not lead to its enactment, and so steps are needed to encourage behaviors that enact policy and lead to personal behaviors that reduce harms generated by environmental hazards.

This presentation does not provide “the solution” to the many challenges of communicating complex environmental hazards, but it does offer insights and steps, backed by research, that are working in some communities and with media professionals. It showcases a recent study in Columbia, South Carolina, where TV Meteorologist Jim Gandy at CBS affiliate WLTX-TV has been presenting climate change science and its relevance to his on-air and Internet audiences for nearly a decade. Gandy’s approach, bolstered in the last several years by Climate Central and the Center for Climate Change Communication at George Mason University, with support from the National Science Foundation, has had a positive impact on his on-air audience’s knowledge of what climate change is and why it is harmful to the health of South Carolinians (Zhao et al., 2014). Many of Gandy’s steps, and those of scientists with whom he works, illustrate best practices for effective communication concerning environmental hazards.

Culturally Appropriate Communication: Development of Indigenous Health Indicators

Jamie Donatuto and Larry Campbell, *Swinomish Indian Tribal Community*

The overarching aims of the Indigenous Health Indicators Project are to create and test a set of community-based indicators of Indigenous health specific to Native American tribal communities in the Puget Sound/Salish Sea region of the Pacific Northwest. Indigenous Health Indicators (IHIs) are necessary because current U.S. government public health regulations and policies are based on a position that does not connect risks and impacts to social or cultural beliefs and values integral to Native American definitions of health. By constructing a more complex, narrative set of indicators beyond the physiological for tribal communities, a more accurate picture of health status is gained with which to better evaluate and manage tribal public health risks and impacts.

While our approach focuses on our Coast Salish ways, we believe that the concepts, objectives, and IHI tool itself are germane for indigenous communities globally as well as serve as a model that is also applicable to those seeking to culturally adapt measurements. We seek to continue testing the IHIs with diverse indigenous communities across North America and beyond.

Session 2: Environmental Health Literacy and the Needs of Diverse Audiences

The Pediatric Environmental Health Toolkit (PEHT) and the Role of Prevention in the Clinical Setting

Mark Miller, *University of California San Francisco Pediatric Environmental Health Specialty Unit*

Few clinicians feel confident in discussing environmental health (EH) risks, although parents rate them of high concern. Lack of training on the links between environment and health and lack of available clinical tools for patient education contribute to the inattention to this topic in the clinical setting. In an effort to promote pediatric environmental health awareness and ultimately behavior change in the clinical setting, members of the Boston and San Francisco Physicians for Social Responsibility (PSR) along with the

University of California, San Francisco Pediatric Environmental Health Specialty Unit (UCSF PEHSU) and members from the American Academy of Pediatrics in California and Massachusetts, developed and field tested provider and patient educational materials keyed to developmental stages for use during health supervision visits.

Our experience, including pre and post surveys, suggests the PEHT is an effective and useful tool to integrate an educational environmental health curriculum into the ambulatory clinic setting. The goal of making environmental health an accepted part of pediatric ambulatory training and practice will be realized through faculty development, making EH topics a routine part of charting and patient education materials, and continued focus on EH content in the curriculum with simple education.

Community Engagement through Enhanced Environmental Health Literacy

Neasha Graves, *University of North Carolina- Chapel Hill*

This presentation will describe a productive collaboration among Breast Cancer and Environment Research Program (BCERP) and the UNC School of Information and Library Science (SILS) researchers and community partners, focused on effectively communicating about risk factors for basal-like breast cancer and improving the environmental health literacy of young, African American women. The Community Outreach and Engagement Core (COEC) in the UNC Chapel Hill Center for Environmental Health and Susceptibility translates the Center's environmental health research into knowledge that can be used to improve public health across North Carolina and the United States. The COEC actively strives to build the capacity of its community partners and public health professionals to inform people in local communities about how susceptibilities interact with environmental factors to cause asthma, breast cancer, obesity and other diseases. The COEC also plays an instrumental role in convening community partners for the UNC BCERP. Over the past four years, COEC and BCERP staff has engaged young, African-American women in an effort to raise awareness of health disparities associated with basal-like breast cancer. These efforts have included formative research to efforts identify knowledge gaps, a partnership with researchers the SILS and active engagement of susceptible populations in development and review of innovative, electronic educational materials.

Development and Implementation of Occupational Health and Environmental Literacy Training for Various Audiences

Mitchel Rosen, *Rutgers University* and Francisco Javier Saracho Manzanedo, *Unviersidad Metropolitana*

This presentation will focus on the development and implementation of occupational health training for various audiences. The sectors of the workforce that are reached through our training programs include professional and worker populations, union and non-union, volunteers, and community members. This diversity present challenges for the development of training programs to effectively meet the needs of each of these audiences. The presenters will discuss outreach and training they have developed for these populations, including how to reach low literacy audiences, non-English speaking workers, and lay community members. Information on how materials are developed and adjusted for these various audiences, and what tools are included to maximize the effectiveness of training will be provided. The

impact of training goes beyond those that attend courses, and we will present some of the influences it has had on policy and government. The training programs that will be discussed include the NIEHS-funded NJ/NY Hazardous Materials Worker Training Center, the NIOSH-funded NY/NJ Education and Research Center, and other programs offered through the Rutgers School of Public Health and the Universidad Metropolitana INEDA. Key concepts of this session are know your audience, understanding culture, and language. Addressing these concepts in the development of training is provided is essential to developing successful training programs.

Session 3: Tools and Technologies- Methods for Raising EHL

Use of Mapping, GIS, and Spatial Statistics to Increase Environmental Health Literacy in Community Settings

Paul English, *California Department of Public Health*

The visualization of environmental health data through maps using advanced geographic information systems (GIS) and spatial statistic methodologies can be an extremely helpful tool in identifying risk patterns and communicating vital information which can increase environmental health literacy in communities. However, these techniques can pose challenges in stakeholder comprehension and usability if audiences are not familiar with scientific or statistical concepts, technical concepts have not been adequately communicated in an audience-appropriate manner, or the data shown do not accurately portray on-the-ground risks. The California Environmental Health Tracking Program, a program funded by the Centers for Disease Control and Prevention and other sources, including NIEHS, has visualized environmental data such as agricultural pesticide use and health data such as asthma emergency room data using GIS maps and statistical modeling to communicate risk clearly and understandably to communities. In this presentation, we will show three examples: identifying “hot spot” geographic areas of elevated risk of invasive breast cancer using a participatory approach with breast cancer stakeholders; the use of sub-county modeled maps of adverse reproductive outcomes to communicate risk to the public; and the use of hazard/asset mapping and community input on pollution sources to locate low cost particulate monitors. Issues of communicating scientific uncertainty, preserving data confidentiality, and scientific credibility will be discussed. Evaluation results will be presented including data usability, comprehension of information, barriers for effectiveness, and suggestions for future improvements.

New Tools for Detecting and Communicating Environmental Exposures and Risks Associated with Oil and Gas Extraction

Sara Wylie, *Northeastern University* and Deborah Thomas, *Shale Test*

Communities across the United States are increasingly living amidst oil and gas development and they are concerned about possible health effects. This talk highlights tools that communities have used to map and understand environmental exposures associated with oil and gas extraction that may adversely affect their health. In particular, we focus on a novel method of visualizing Hydrogen Sulfide (H₂S) exposure using

photographic paper, which tarnishes with exposure to H₂S. Due to exemptions from federal regulations such as the Clean Air Act and Safe Drinking Water Act emissions effecting air and water quality from this industry are largely unmonitored and unreported. In addition, existing stationary monitors are too distributed to meaningfully track community exposures. H₂S is a neurotoxic gas frequently associated with natural gas and oil extraction. Communities in Wyoming report smelling the rotten egg odors associated with H₂S and describe symptoms of H₂S exposure. However, pinpointing sources of H₂S when there might be 25 wells per acre, and multiple emission points, is a challenge. This talk describes our pilot work investigating how photographic paper can be effective in identifying and mapping sources of H₂S exposure, and in communicating these exposures.

Breast Cancer Communication & Photovoice: Increasing EHL in Youth

Alexandra Anderson, *Zero Breast Cancer*

Recent study findings have shown a trend of girls going through puberty at younger ages, with early puberty as a risk factor for breast cancer. The Cohort of Young Girls' Nutrition, Environment, and Transitions (CYGNET) Study looking at how factors in our environment, particularly exposure to chemicals, our lifestyle and our genes affect when girls start puberty. The Youth Advisory Board (YAB) was created to make sure the activities of the study are designed to meet the needs of the study participants and youth overall. During the second year of the YAB, participants produced a Photovoice project about what they had learned about environmental health and how it is experienced in their own communities. Photovoice, an innovative method used to capture adolescents' perceptions and experiences of their environment, allowed YAB members to document their environmental health at home, at school, and anywhere else they spend a significant amount of time, and utilize visual media as an effective medium to successfully communicate environmental health advocacy methods from adolescents to the community at large.

Session 4: Future Directions for EHL/CREHS

A Communication Science Approach to Developing and Evaluating Environmental Health Messages

Kami Silk, *Michigan State University*

Designing environmental health messages requires a systematic, evidence-based approach sensitive to audience attitudes, beliefs, knowledge, literacy issues, and potential barriers. Dr. Silk will present an audience-centered message development approach that highlights the roles of formative research, process evaluation, and summative evaluation procedures. She will provide exemplars from her work with the Breast Cancer and Environment Research Program and other projects to illustrate a systematic process for message development and evaluation. Dr. Silk will also pose some key questions to help provide a catalyst for discussion of future directions for environmental health literacy practitioners and researchers.

Importance of EHL to NIEHS Mission: New Partners for Research

Gwen Collman, *NIEHS*

Partnership building is central to advancing the NIEHS mission, especially when exploring new topic areas in environmental health sciences research, such as communication research and environmental health literacy. This presentation focuses on the critical partnerships with specific groups and organizations, as well as with other fields, necessary to inform and enhance our efforts to promote environmental health literacy and to apply methods and approaches from communication research to environmental health science research. The presentation ends by offering a few recommendations for new directions and soliciting insights from meeting participants.