

NURSING AND ENVIRONMENTAL HEALTH ROUNDTABLE

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Final Report

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LIST OF ACRONYMS

AAAAI	American Academy of Asthma, Allergy, and Immunology
AAN	American Academy of Nursing
AAOHN	American Association of Occupational Health Nurses
ACNM	American College of Nurse-Midwives
ANA	American Nurses Association
ANCC	American Nurses Credentialing Center
AOEC	Association of Occupational and Environmental Clinics
APHA	American Public Health Association
ASTDN	Association of State and Territorial Directors of Nursing
ATSDR	Agency for Toxic Substances and Disease Registry
AWHONN	Association of Women's Health, Obstetric, and Neonatal Nurses
CDC	Centers for Disease Control and Prevention
CEHN	Children's Environmental Health Network
EHSWG	Environmental Health Sciences Working Group
EPA	U.S. Environmental Protection Agency
ERC	Education and Research Centers
HHS	U.S. Department of Health and Human Services
HRSA	Health Resources and Services Administration
IHS	Indian Health Service
IOM	Institute of Medicine
JCAHO	Joint Commission on Accreditation of Healthcare Organizations\
<i>MMWR</i>	<i>Morbidity and Mortality Weekly Report</i>
NAPNAP	National Association of Pediatric Nurse Practitioners
NAS	National Academy of Sciences
NCEH	National Center for Environmental Health
NCLEX	National Council Licensure Examination
NEETF	National Environmental Education and Training Foundation
NIEHS	National Institute of Environmental Health Sciences
NIH	National Institutes of Health
NIOSH	National Institute for Occupational Safety and Health
NINR	National Institute of Nursing Research
NLM	National Library of Medicine
NOA	Nursing Organizations Alliance
NORA	National Occupational Research Agenda

INTRODUCTION

Every day, nurses contribute to improving health and reducing health disparities in the United States. Often underappreciated, they are nevertheless ubiquitous in human environments and are the nation's largest group of health care professionals. Nurses interact with people at pivotal times throughout their lives. They offer a human touch and expertise on the front lines of health care, including in homes, in schools, at workplaces, in communities, in health care facilities.

Together with other public health professionals, nurses have championed sweeping public health campaigns in this country. They have helped to curtail enteric diseases through better sanitation practices, to eradicate childhood polio through immunization, to reduce infant mortality through a variety of health advances, and to improve occupational health through child labor and workplace safety laws. And these are only part of their contributions.

After World War II, shifts in health care delivery resulted in less of an emphasis on the environment as one of the major domains of nursing practice. Over the decades, health care in general became more specialized, focusing more on the treatment of diseases rather than on prevention. Federal and state budget cuts and task-based medical reimbursement schemes have further undermined many important public health practices.

Today, many nurses are recognizing the importance of the environmental factors as significant to nursing practice. The role of nurses in environmental health is expanding. It has taken on new urgency as new threats—from bioterrorism and drug-resistant bacteria to toxic industrial wastes—emerge every day. Nurses are ideally situated to address environmental health concerns at the individual and community levels. Nurses have a broad spectrum of specialties and skills, and they are proving pivotal in boosting environmental health. Integration of environmental health into nursing practice, education, and research is needed, but with such a large profession it will not occur overnight.

In recent years, the nursing profession has made significant progress in the environmental health arena. More and more agencies and organizations are supporting the effort. The Agency for Toxic Substances and Disease Registry (ATSDR), for example, launched a successful nationwide initiative to promote integration of environmental health into nursing practice, education, and research. Leading the way at the state level, Vermont recently passed a law requiring that every local district health office have an environmental health nurse on staff. University-based outreach projects led by nurses are making inroads at the community level. These include projects that focus on lead-exposed populations in Cincinnati's inner city to cancer clusters near a nuclear power plant in rural Montana. Environmental health is being incorporated into more undergraduate nursing school curricula. In addition, two full-time graduate degree programs in environmental health nursing have been established—one at the University of Texas at El Paso and another at the University of Maryland Baltimore.

Meeting Background

Initial steps taken by the Institute of Medicine (IOM) in 1993 led to the issuance of the 1995 IOM report *Nursing, Health, and the Environment* (IOM 1995) and sparked the renaissance in environmental health nursing. In 1996, the National Institute of Nursing Research (NINR) convened a special Environmental Health Sciences Working Group (EHSWG) to identify knowledge gaps in environmental health science and to identify research opportunities and challenges. NINR published the meeting report in *Nursing Outlook* in 1997 (Grady et al. 1997). In 1999, ATSDR convened a nationwide strategic planning work group. Shortly thereafter, a strategic planning workshop was organized by the National Environmental Education and Training Foundation (NEETF).

The National Institute of Environmental Health Sciences (NIEHS), ATSDR, and NINR organized the August 2002 Nursing and Environmental Health Roundtable in Research Triangle Park, North Carolina, to build on previous efforts and identify areas for possible collaboration for environmental health around three specific themes: research, education, and translation to practice. Three leaders in environmental health nursing were invited to serve as session leaders for the roundtable discussions. Before the meeting, each session leader developed papers on the three themes; during the meeting, they led breakout discussions on their respective topics. Roundtable participants included representatives of various organizations nationwide, including schools of nursing, departments of health, national associations, and federal agencies such as the U.S. Environmental Protection Agency (EPA), the National Institute for Occupational Safety and Health (NIOSH), the Centers for Disease Control and Prevention (CDC), and the Health Resources and Services Administration (HRSA) of the U.S. Department of Health and Human Services (HHS).

Timeline of Events

1993 – IOM conducted a workshop to assess the need for a study of nurses' roles in environmental and occupational health

1994 – IOM established the Committee on Enhancing Environmental Health Content in Nursing Practice to conduct the study

1995 – IOM published *Nursing, Health, and the Environment*

1996 –NINR convened the EHSWG

1997 – NINR published a meeting report in *Nursing Outlook*

1999 –ATSDR convened a strategic planning work group

1999 – NEETF organized a strategic planning workshop

2002 – NIEHS, ATSDR, and NINR convened the Nursing and Environmental Health Roundtable

Highlights of Key Recommendations

During the roundtable, participants discussed a wide range of ideas and made the following six recommendations:

Develop a Research Agenda

Participants discussed the need for an environmental health nursing research agenda. The core of the agenda should identify research topics, define goals, and establish priorities. The agenda should recognize past and current successes, take into consideration challenges and barriers associated with

environmental health research, and include strategies for improving publication and dissemination of research findings to public health professionals and the public. Such an agenda could also address roles for student involvement in environmental health nursing research and the establishment of partnerships with leading groups already engaged in research.

Roundtable participants identified five research questions to consider in establishing an environmental health nursing research agenda:

- What differential diagnoses emerge when environmental health is incorporated into the nursing assessment process?
- What are the cumulative effects of low dose, long-term exposure to environmental toxicants?
- What regional-specific environmental issues exist?
- What are best practices in environmental health nursing?
- What are the benefits of environmental health nursing interventions?

Establish Clearinghouse

Currently, articles on environmental health and nursing are scattered throughout literature across numerous journals and disciplines. Moreover, the role of nursing is not always evident in literature citations. Participants recommended that a clearinghouse be developed to catalog and facilitate access to environmental health education materials, curricula, and research in an effort to raise awareness and foster greater involvement by other nurses. Through the clearinghouse, both national and international publications could be cataloged and accessible online or in hard-copy format.

The clearinghouse could also serve as a virtual hotline where practicing nurses could get answers to specific questions or get referrals to experts on a current environmental health issue they are addressing. The clearinghouse would also serve as a means to monitor progress in environmental health nursing at all levels.

Promote Publication and Dissemination

Roundtable participants discussed the need to advance efforts in publication and dissemination of environmental health nursing research and information. One strategy suggested was to create a journal with a specific emphasis on environmental health nursing. Publication of articles on leading environmental health topics in major nursing journals was also recommended. Participants supported efforts to continue environmental health columns in the *American Journal of Nursing*.

Improve Integration Into Curricula

Roundtable participants recommended integrating of a core set of environmental health fundamentals into undergraduate nursing curricula. Field experiences were also encouraged as part of core curricula. In further support of nursing education, best practices related to environmental health should also be defined and integrated into undergraduate curricula. Environmental components such as assessment, cultural sensitivity, and research could be woven into existing nursing coursework.

Roundtable participants recommended integrating environmental health into advanced practice—master’s and doctoral education programs—curricula as well. Publication of “best practices” for environmental health nursing would likely facilitate academic use in nursing education at all levels.

Strengthen Partnerships and Resources

Developing and sustaining partnerships with leading academic institutions, professional groups, and government organizations was also a key recommendation identified by the roundtable participants. Partnerships with organizations such as the American Academy of Nursing (AAN), for example, could be instrumental in furthering recommendations to incorporate environmental health into textbooks, curricula, and core competencies for practice. Collaborating with the American Nurses Credentialing Center (ANCC), Nursing Organizations Alliance, and other groups to incorporate environmental health related questions into National Council Licensure Examination (NCLEX) testing and other certification exams could also work toward this end. Similarly, the environmental health content in the Joint Commission on Accreditation of Healthcare Organizations (JCAHO) standards could be expanded.

Participants also recommended creating environmental health nursing research centers or centers of excellence at selected nursing schools across the country. The centers could foster environmental health nursing researchers, help build a cadre of future faculty experts, and incorporate and evaluate the integration of environmental health into clinical practice.

At the community level, nurses could build networks with environmental experts and links with local government, civic organizations, and groups like the League of Women Voters and the Sierra Club. Expanding appropriate community programs and partnerships, such as local emergency planning commissions or lead abatement programs, to include environmental considerations was also recommended. Partnerships should maximize program strengths and synergistic relationships. For example, universities with strong environmental health programs that lack schools of nursing could collaborate with universities with schools of nursing that lack environmental health departments. Such partnerships could lay the foundation for environmental health teaching centers.

Roundtable participants highlighted the need to create more reference materials and tools for use in the field and workplace. ATSDR’s I PREPARE pocket guide (ATSDR 2001), a mnemonic to assist health professionals in obtaining environmental exposure histories as a part of their health assessments, is a good example of the type of tool needed.

Expand Funding Sources

Another recommendation by the roundtable participants was the identification and development of new funding sources and mechanisms to support environmental health research, education, and practice. Roundtable participants recommended joint program announcements by agencies such as NINR and NIEHS. The inclusion of a nursing perspective as part of funding requirements was recommended to promote the growth of environmental research in nursing. Developing a matrix of related grants and funding announcements from federal, nonfederal, and foundation sources was also recommended to facilitate the process of identifying funding sources and simplifying the application process.

Funding sources should be identified to support content-specific training on topics such as pesticide exposure in rural settings. Funding should be identified to support fellowships, sabbaticals, conference attendance, and rotations through federal environmental health agencies like CDC or ATSDR.

Overview

Environmental health nursing is being revitalized and strengthened. The recommendations outlined in this report can serve to better coordinate environmental health nursing research, education, and translation to advances in practice. If implemented, these recommendations will establish a strong foundation for environmental health nursing. This report is organized around the three roundtable themes: research, education, and translation to practice. The following sections, written by the session leaders, highlight the current state of the science and incorporate recommendations made during the course of the roundtable. The report also includes a list of suggested reading materials.

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ENVIRONMENTAL HEALTH NURSING RESEARCH

Session Leader: Linda McCauley, PhD, RN, FAAN

Challenges and Barriers

During the last decade, increased emphasis has been placed on the impact of environment on human health and the need for nurses to engage in research to advance knowledge in this field. Several nurse researchers received funding for environmental health projects focused on prevention of lead exposures, environmental factors and asthma, pesticide exposures among workers and their families, environmental awareness, and occupational health. Despite these efforts, significant needs still exist.

In the 1995 IOM report *Nursing, Health, and the Environment*, the scope of environmental and occupational health nursing research was reviewed (IOM 1995). Of 4,492 funded projects from 1990–1994, only 21 were identified as nursing research in environmental or occupational health. Likewise, only 1.3% of nursing research literature was in the area of environmental or occupational health. In these reviews, the focus of the grants and published reports was primarily occupational health (91.4%). One purpose of the 2002 Nursing and Environmental Health Roundtable was to examine factors contributing to the lack of nursing research and to propose potential solutions. Four areas of potential focus were initially presented to the roundtable attendees with the expectation that further discussions would both expand and enrich these descriptions. The four areas are workforce issues, potential areas of research emphasis, need for a multidisciplinary perspective, and research-practice linkages.

Workforce Issues

Since the 1970s, the numbers of nurse researchers in the areas of occupational and environmental health have been insufficient. NIOSH has taken a lead role in increasing the numbers of nurses who are educationally prepared to conduct environmental and occupational health research.

Recent data on graduates from NIOSH training programs in occupational and environmental health nursing are shown below:

Year	1996	1997	1998	1999	2000
Master's	54	64	55	63	32
Doctoral	2	3	0	4	3

These graduate programs are at Johns Hopkins University, University of North Carolina, University of Alabama, University of Cincinnati, University of Illinois, University of Michigan, University of Minnesota, University of Washington, and University of California San Francisco. Unfortunately, two universities with long histories of occupational and environmental health nursing programs recently closed their training programs (University of Utah and Mt. Sinai) due largely to the inability to recruit nurses who have doctoral degrees to direct these programs.

Although these programs are academic settings with concentrated graduate training in occupational and environmental health nursing, they do not include other areas such as health policy, epidemiology,

and toxicology that prepare individuals to launch successful research programs focusing on environmental health. The numbers of nurse researchers in these allied areas are difficult to capture. Likewise, it is difficult to track the number of nurses doing environmental health research without looking across different National Institutes of Health (NIH) Institutes and other funding bodies such as EPA, CDC, ATSDR, the National Academy of Sciences (NAS), and private foundations. Strategies to more accurately determine the number of nurses engaged in environmental health research are of critical importance.

NINR is another potential research training source. NINR's mission statement clearly reflects the need for research in the areas of health promotion, disease prevention and health disparities, and vulnerable populations. Environmental health is a key focal point within each of these larger targeted areas. The extent to which NINR training grants and projects are directed to nurses conducting environmental research is unknown. The progress of the research training opportunities within NINR for nurses specializing in environmental health needs to be continually monitored.

Potential Areas of Research Emphasis

Several research priority lists have been developed over the past years. Following are lists from the 1995 IOM report (IOM 1995), the American Association of Occupational Health Nurses (AAOHN) (Rogers et al. 2000), the National Occupational Research Agenda (NIOSH 2000), and NINR.

IOM Report, 1995

The 1995 IOM report outlined potential research areas for nurses to serve as investigators in environmental health, including,

- taking environmental health histories and looking for trends in exposure, illness, and injury;
- being alert to environmental factors that influence health;
- working with interdisciplinary teams and with agencies to determine if an environmental exposure is affecting the health of a community;
- initiating or engaging in research to identify and control environmental exposure that adversely affect human health; and
- working with public and private institutions to perform risk and hazard assessments.

AAOHN Research Priorities, 2000

It is important to determine research priorities in environmental health nursing. Currently, nurses interested in environmental health research can consider related sources to guide their scientific inquiry. AAOHN published research priorities for occupational health nursing in 1989 and 2000 (Rogers et al. 2000).

- Effectiveness of primary health care delivery at the work site.
- Effectiveness of health promotion nursing intervention strategies.
- Methods for handling complex ethical issues related to occupational health.
- Strategies that minimize work-related health outcomes (e.g., respiratory disease).
- Health effects resulting from chemical exposures in the workplace.

- Occupational hazards of healthcare workers (e.g., latex allergy, bloodborne pathogens).
- Factors that influence workers' rehabilitation and return to work.
- Effectiveness of ergonomic strategies to reduce worker injury and illness.
- Effectiveness of case management approaches in occupational illness and injury.
- Evaluation of critical pathways to effectively improve worker health and safety and to enhance maximum recovery and safe return to work.
- Effects of shift work on worker health and safety.
- Strategies for increasing compliance with or motivating workers to use personal protective equipment.

National Occupational Research Agenda

Another set of research priorities directly applicable to environmental health nursing is the National Occupational Research Agenda (NORA) (NIOSH 2000). The agenda outlines the major research priorities specific to occupational health. Both the NORA and AAOHN research priorities are directly applicable to researchers focusing on exposures and health of persons in their work environments.

NINR

The mission of NINR and specific goals of its 5-year strategic plan are congruent with recognizing and funding studies of environmental factors and human health, but NINR has not yet formulated specific research priorities in environmental health. Although several of the NINR priority areas can be extrapolated to a broader environmental context, it is preferable to delineate specific research priority areas for environmental health nursing. The mechanism for completing this project needs to be determined. Academic bodies, funding bodies, or professional organizations usually generate research priority areas. The appropriate body to spearhead the project on environmental health nursing priorities needs to be determined. Nurse researchers interested in environmental health issues need to encourage collaboration and to minimize competition among each other.

Need for a Multidisciplinary Perspective

Environmental health nurse researchers bring knowledge in nursing research methods as well as more traditional areas of environmental health research, such as human disease manifestation, risk assessment, and risk management. Many of the priority areas of environmental health nursing research rely on methods of exposure assessment, risk assessment, and risk communication.

Training in environmental health issues is sorely needed in schools of nursing to prepare practitioners to serve in investigative roles in environmental health. Research trainees in schools of nursing need opportunities to broaden their knowledge of the impact of environmental factors on health. Joint programs between schools of nursing and schools of public health provide rich opportunities for cross-disciplinary training. The importance of this aspect of research training is exemplified by the interdisciplinary component that is present in all NIOSH-funded Education and Research Centers (ERCs). In these funded centers, students and faculty from schools of nursing and departments or schools of public health interact in classrooms and seminars, field investigations, and research projects. All trainees learn what the other disciplines bring to the prevention of injury and illness in the workplace. The interdisciplinary focus of the centers is a key component of obtaining both initial funding and continuation funding. Given this training emphasis, it is not surprising that most

environmental health nursing research to date has focused on interdisciplinary applications in work environments. Schools of nursing are challenged to expand the opportunities for cross-discipline training to increase the numbers of nurse researchers who are prepared for multidisciplinary research endeavors.

Research-Practice Linkages

There are some excellent examples of research and surveillance projects that address the research-practice interface. Public health nurses played a crucial role in improving the surveillance of agricultural injuries and illness in the 1990s via the Farm Family Health and Hazard Surveillance Program funded by CDC and NIOSH. This program was developed to respond to Congress' concern that agricultural workers and their families experience a disproportionate share of disease and injury associated with the chemical, biological, physical, ergonomic, and psychological hazards of agriculture. The programs highlight the potential role of public health nursing and serve as examples of how the use of monitoring and evaluation can improve environmental health (www.cdc.gov/niosh/ffhhs.html). Although the funding for these programs ended, nurses continue to develop sustainable public health surveillance roles in several of these states, such as Iowa, Wisconsin, and Kentucky.

As research priorities in environmental health nursing are developed, it is crucial to examine barriers created by the current health care system that could impede the implementation of research projects in practice settings. Nurses are the major group of health care providers who interface with the public and are often the first point of entry into health care systems. The education and practice of nursing is multifaceted and represents optimal opportunities for the integration of environmental health assessment and interventions across specialty areas of practice. Among the various specialty areas, public health nurses have the most obvious fit with environmental health nursing. Nonetheless, because the practice of public health nursing can vary, but is often limited by the practice settings, implementation of environmental health concepts should not be restricted to any one or few specialty areas. Rather, nursing should strive to test models of environmental interventions by nurses across specialty areas so that practice can appropriately incorporate environmental health research findings to reach target populations.

Moreover, findings in one community might not be generalizable because of differences in public health practice across communities. Opportunities for public health nurses to link with scientists need to be explored. Nurses could play crucial roles in translational environmental health research projects and outreach and education. It is clear that the development and implementation of a research agenda in environmental health nursing is crucially tied with workforce issues in public health nursing. To pursue research programs assessing the impact of nursing interventions in environmental health, a critical mass of nurses must be in practice settings in schools, work settings, and communities to test interventions and to apply research findings.

Community-based research and prevention projects offer excellent opportunities for nurse researchers to build collaborations among community members, advocacy groups, health providers, and academic researchers. Studies of health disparities and environmental exposure and disease risk are sorely needed.

Previous Work

The four areas of need described previously have also been recognized by nursing expert panels. After the 1995 IOM report (IOM 1995), an Environmental Health Sciences Working Group was convened by NINR to identify gaps in environmental sciences, along with research opportunities and challenges that could be explored through investigator-initiated clinical studies (Grady et al. 1997). The deliberations of this panel were framed under three broad concepts: target populations, target areas for clinical studies, and research infrastructure needs. The report stressed the need for new and innovative research strategies to study long-term, delayed, and potential transgenerational health effects from environmental exposures in target populations, including studies of exposure and susceptibility factors. The report stressed that interdisciplinary and multidisciplinary partnerships among researchers would be essential if nursing research is to have an impact on environmental health challenges. Jointly sponsored training programs among NINR, NIEHS, and the NIH Office of Behavioral and Social Sciences were given as illustrations of such partnerships.

Working Group Deliberations

As the attendees at the 2002 meeting broke into small work groups to discuss recommendations for research, the general consensus was that the four areas presented initial thoughts on how to build an infrastructure for nursing research in environmental health. The 1997 NINR working group outlined what needs to be done to advance the nursing environmental research agenda (Pope et al. 1997), but the mechanisms to bring about growth and accomplishments in this area seemed to be missing.

Resources

Resources are lacking to build nursing research capacity in environmental health. Nursing lacks a critical mass of nursing researchers in the area of environmental health. Even if research priorities are established, few nurses now have the educational and research training needed to develop innovative and fundable research programs in the area. These few nurses who are prepared to conduct research programs in this area are widely dispersed across the United States. This scarcity keeps nurses in this area from successfully competing for focused research training funding within schools of nursing in mechanisms such as T32 Institutional Training Grants.

Historically, NIEHS has built research capacity through NIEHS Environmental Health Science Centers in 22 universities throughout the United States. Although a major focus of these centers is interdisciplinary interaction, no a specific requirement exists with regard to the centers incorporating the research training of public health physicians and nurses. These centers could be potential partners with nurse scientists to develop core areas specific to the research training of nurse scientists.

Roundtable attendees also felt that the predoctoral traineeship mechanism (F31) for NIH presents economic barriers for predoctoral trainees in nursing. Candidates often tend to be older persons with responsibilities that prevent them from immersing themselves in a traineeship with a stipend much lower than what they would earn as a practicing nurse.

The challenge of environmental health research will require that nurse researchers engage in multidisciplinary efforts to best address pressing research needs. However, nurse scientists need resources to guide them in establishing these partnerships. Many schools of nursing exist without close ties with schools of public health or departments of environmental health. Mechanisms are needed to link nurse researchers with environmental health researchers in other disciplines.

Priorities in environmental health nursing research need to be established to serve as a resource to guide future research development and funding decisions. NORA and the research priorities established by AAOHN are excellent resources to guide research development. An expanded document, built on a consensus methodology, is needed for environmental health nursing. Grady et al. (1997) outlined areas that were especially promising for cooperative nursing research, including

- the development of surveillance methods,
- barriers to the use of personal protective equipment,
- interventions to decrease the risk of pesticide exposure among farm workers,
- environmental-immune interactions,
- cohort studies of environmental exposures and health effects,
- environmental exposures and effects on developing fetuses,
- health effects associated with exposure to hazardous waste sites,
- susceptibility and lead poisoning,
- community differences in risk perception, and
- the impact of environmental justice activities on communities.

Participants at the 2002 roundtable generated other potential research topics, including

- nursing diagnoses arising from environmental health assessments;
- cumulative effects of low dose, long-term exposure to environmental hazards;
- assessment of the impact of environmental health research on nursing practice;
- research that transcends the single agent model and brings a broad perspective to the research questions and methodology;
- research on individual factors and risk perception, particularly in vulnerable populations;
- assessment of the impact of environmental health nursing interventions; and
- assessment of the outcomes of environmental prevention.

Clearly, the 2002 roundtable attendees and previous working groups have had no difficulty identifying areas in which nurse researchers could make an impact. However, adequate resources, including more researchers in the field, are needed to begin to effectively address environmental research priorities.

It is difficult to assess the impact of nursing research on the field of environmental health because a central clearinghouse for research and publications in the field is lacking. As we build capacity in environmental health nursing research, we need resources that will accurately describe the matrix of nursing environmental research that is taking place. The 1995 IOM report (IOM 1995) developed an initial database of current funding and publications. These data need to be incorporated into an ongoing database. This database can be used to assess accomplishments over time and to serve as a ready

resource for persons seeking to identify where nursing environmental health research is taking place, what target areas are being addressed, and the impact of such research.

Partnerships

NINR, NIEHS, and other federal groups have partnered successfully in discussing the need for more environmental health nursing research as well as the major challenges and barriers. As action plans are developed to create change in this area, this partnership model should be continued. Although all parties represented at the 2002 roundtable seemed enthusiastic about potential partnerships, plans are needed that will link agencies and groups with recommended actions. Other partners need to be explored. AAN is a potential resource to highlight the status of environmental health research, education, and practice. Because a critical mass of nurse investigators in environmental health is lacking, creative partnerships between schools of nursing are needed. Unique models for environmental health nursing research and training centers that represent centers without walls and partnerships between institutions are a potential solution to building capacity. Many of the roundtable participants expressed the need to establish centers of environmental research excellence. Potential partnerships with the NIEHS Environmental Health Science Centers need to be explored. Cross-training of nurses in environmental health science is an essential component to building research capacity. Partnerships between nursing and other academic units are necessary to make this cross-training successful.

Next Steps and Action

Roundtable participants generated potential action steps to promote greater visibility for nurses and environmental health:

- Establish a journal with a specific emphasis on environmental health nursing.
- Create a mechanism to catalog existing publications in environmental health nursing online.
- Establish a mechanism to catalog the matrix of grants and awards focusing on environmental health nursing or to recognize those multidisciplinary projects with a significant nursing component.
- Disseminate environmental health nursing research presented at professional meetings such as that of the American Public Health Association (APHA).
- Develop a supplemental issue of *Environmental Health Perspectives* focusing on nursing and environmental health.
- Designate the appropriate agency or group to develop and prioritize an environmental health nursing research agenda.
- Promote joint program announcements (for example, NINR and NIEHS) requiring public health nursing involvement.
- Incorporate interdisciplinary investigators, including health care providers, in calls for research proposals in environmental health.
- Establish research career development opportunities for predoctoral, junior, and postdoctoral nursing investigators that recognize the career pathways of nurses.
- Establish multiinstitutional T32 awards to develop the next generation of environmental nurse researchers.

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ENVIRONMENTAL HEALTH EDUCATION AND NURSING

Session Leader: Barbara Sattler, RN, DrPH

Introduction

The daily reminders about environmental health threats in the popular media are alerting the American public to the relationship between the environment and health. In 2002, the United Nations released a major report (UN 2002) in preparation for the U.N. Earth Summit, which was attended by more than 100 world leaders.

Some examples of the links between environment and health from the UN report follow:

- “Services provided by freshwater ecosystems [e.g., water purification, recycling and transport of nutrients, fish production] are threatened.
- Low-income countries depend on biomass energy, but it [e.g., smoke from biomass cooking] is a health threat for billions.
- Over 1 billion people still lack access to safe water. In...the least developed countries, disease and death—often in childhood—are primarily due to communicable, environment-related diseases... [such as] diarrhea due to lack of clean water and sanitation facilities.
- Indoor air pollution [mostly due to particulate pollution] is a major killer.”

The nursing profession must prepare for the current and projected human health problems that are the result of a compromised environment while advocating for improved environmental conditions. This preparation must consist of a comprehensive plan for the education of the nursing profession including its educators, students, practitioners, and leaders. The preparation must cover the full range of nursing practice: assessment, planning, intervention, and evaluation.

Dr. Stephanie Chalupka explored the position of deans of schools of nursing regarding environmental health and nursing. Of the deans surveyed, 94% believed environmental health should be given moderate to substantial emphasis. Although deans felt that environmental health was important and should be integrated into their curricula, they noted that their faculty was not prepared to teach environmental health concepts and that environmental health questions are not emphasized on the NCLEX for Registered Nurses (the exam process that grants a nurse the authority to practice). The responses from deans were relatively uniform regardless of institutional type or size (Chalupka 1998).

Although virtually every nursing model includes the environment as a determinant of health, little detailed attention is paid to the precise exposures, the resultant health threats, or the interventions necessary to remove or reduce the environmental health risks. (A few exceptions to this exist, such as exposure to tobacco smoke.) In light of such informational and educational deficits, significant integration of environmental health into modern nursing has been lacking. This notion has been substantiated in IOM’s 1995 *Nursing, Health, and the Environment* (IOM 1995), which recommended the development and support of a comprehensive approach to incorporate environmental health into nursing.

Since the release of the 1995 IOM report, a number of successful educational activities have taken place. This section will briefly review the IOM educational recommendations, describe some recent

efforts in environmental health education for nurses, and make specific recommendations for addressing current gaps in environmental health education for nurses.

IOM Recommendations

The IOM report established a set of environmental health competencies for all nurses:

- *Basic Knowledge and Concepts*—All nurses should understand the scientific principles relating health to the environment, including exposure pathways, prevention and control strategies, the interdisciplinary nature of effective interventions, and the role of research.
- *Assessment and Referral*—All nurses should be able to complete an environmental history, recognize potential environmental hazards and sentinel illnesses, make appropriate referrals, and educate their patients and communities about environmental health.
- *Advocacy, Ethics, and Risk Communication*—All nurses should be able to demonstrate knowledge of the role of advocacy (case and class), ethics, and risk communication.
- *Legislation and Regulation*—All nurses should understand the policy framework and major pieces of legislation and regulations about environmental health.

The specific recommendations for education outlined in the IOM report¹ are as follows:

- Environmental health concepts should be incorporated into all levels of nursing education.
- Environmental health content should be included in nursing licensure and certification exams.
- Expertise in various environmental health disciplines should be included in the education of nurses.
- Environmental health content should be an integral part of lifelong learning and continuing education for nurses.
- Professional associations, public agencies, and private organizations should provide more resources and educational opportunities to enhance environmental health in nursing practice.

Recent Efforts in Environmental Health Education for Nurses

Following is a review of recent environmental health education activities. This review shows progress that has been made on the IOM education recommendations.

Environmental Health Concepts Should Be Incorporated Into All Levels of Nursing Education

Several initiatives have been undertaken to develop curricula for integration into nursing education. ATSDR supported the Howard University School of Pharmacy, Nursing, and Allied Health Sciences

¹In the Nursing Education and Professional Development chapter in *Nursing, Health, and the Environment* (IOM 1995), contemporary trends in nursing education are outlined, along with explanations of the accreditation and regulations processes for the nursing profession, a description of nursing educational pathways, and suggested opportunities for curricula integration. In addition to curricula integration, the authors also recommend three methods for enhancing dissemination of environmental health content in nursing education: continuing education, distance learning, and electronic media (CD-ROM). The full report is available at www.nap.edu/books/030905298X/html/index.html.

effort titled the Mississippi Delta Project. For this project, the nursing faculty developed environmental health curricula materials that were both general to nursing and specific to the Mississippi Delta region. This curriculum served as the basis for a series of training courses and workshops for both academic and practicing nurses in the region.

The Kellogg Foundation and NEETF supported an effort by the University of Maryland School of Nursing, in collaboration with Howard University School Pharmacy, Nursing, and Allied Health Sciences and the Southern Region Education Board, that has several components and which has been focused in the 16 southern regional states. Activities under this project (in chronological order) were as follows:

- Provided a workshop for nursing school deans in the southern region.
- Trained more than 200 faculty members during 3-day faculty workshops on the integration of environmental health into nursing curriculum.
- Developed a comprehensive Web portal for nurses on environmental health (www.enviRN.umaryland.edu).
- Developed and facilitated an environmental health nursing electronic mailing list.
- Organized several all-day preconference workshops for nursing subspecialty organizations.
- Provided support for faculty to attend a reunion workshop 1 to 2 years after their original training.
- Gave recognition awards to many of the faculty members who use their new knowledge at their home institutions.
- Developed model undergraduate curricula, which can be found on the Web site.

NEETF supported other initiatives as well. Several years ago, the foundation convened a conference to develop a plan for the integration of environmental health into health practice. This conference created the impetus for an ongoing educational project that targets pesticide poisoning as a learning area for all health care professionals.

As part of this pesticide initiative, which is co-supported by HHS and EPA, several working groups were convened and a comprehensive work plan was created. Two documents have been written (*Recognition and Management of Pesticide Poisoning* [EPA 1999] and *National Strategies for Health Care Providers: Pesticide Initiative Implementation Plan* [NEETF and EPA 2002]) and a meeting to launch the next phase of activities is planned for September 18–20, 2002. This educational initiative is being conceived as a model for the integration of environmental, topic-specific information into health care practice.

The Children's Environmental Health Network (CEHN) has developed the *Training Manual on Pediatric Environmental Health: Putting It Into Practice* (CEHN 1999), an excellent basic primer for nurses and other health professionals. This manual was used in the training of health professionals at all-day workshops associated with the annual meetings of APHA and the National Association of Pediatric Nurse Practitioners (NAPNAP), as well as other health professional meetings. The manual is packaged in modules, which can easily be adapted for inclusion in curricula.

Many new videos are excellent educational tools to be added to syllabi. The University of Vermont created three sets of videos: *The Health Care Industry's Impact on the Environment: Strategies for*

Global Change, Moving Toward a Pollution Prevention Approach in the Healthcare Setting, and Health and the Environment: Exploring Critical Connections Protecting Human Health Means Protecting the Environment. This last, four-part video series was designed by nurses, physicians, and environmental science experts to explore the critical interrelationship of human health and the environment (learn.uvm.edu/profprog/healthcare/products/health_env_video.html). The series connects issues directly to the practices of health professionals by focusing on cancer, asthma, bronchitis, and emerging infections that have environmental etiologies, and by identifying health professionals' roles in preventing environmental problems before they occur. All three video sets were broadcast via satellite after their initial production and included live interaction with the experts who were on the video.

Environmental Health and Nursing, a new book co-edited by Barbara Sattler and Jane Lipscomb, was recently published (Sattler and Lipscomb 2002a). The authors hope that faculty will find this useful in teaching environmental health to nurses. In addition, the authors wrote three chapters in existing nursing texts: one for occupational health nurses (Sattler and Lipscomb 1997), one for community health nurses (Sattler et al. in press), and one for oncology nurses (Sattler and Lipscomb 2002).

National Library of Medicine (NLM) Special Information Systems staff members have been particularly attentive to the needs of nurses with regard to environmental health. They have participated in many environmental health nursing workshops and have developed excellent online toxicology tutorials that can be readily integrated into nursing curricula (sis.nlm.nih.gov/Tox/ToxTutor.html.0628). The NLM holdings are extremely helpful to nurses addressing environmental health issues.

Two nursing schools now have master's degree programs with emphasis in environmental health: the University of Texas at El Paso and the University of Maryland Baltimore. In addition, the University of Maryland has just created a Post-Master's Certificate in Environmental Health Nursing that entails completion of five graduate environmental health nursing courses.

Environmental Health Content Should Be Included in Nursing Licensure and Certification Exams

No concerted effort has been organized to increase the environmental health content for the entry into practice (licensure) exam. Several nursing subspecialty exams have better incorporated environmental health content, such as the certification exams for Pediatric Nurse Practitioners and Nurse Midwives. These incorporations occurred when nurses who champion environmental health took the lead and worked through the appropriate system.

Expertise in Various Environmental Health Disciplines Should Be Included in the Education of Nurses

At the baccalaureate and master's degree level, promotion of multidisciplinary education is occurring in settings that easily lend themselves to such endeavors. For instance, nursing programs at large institutions and/or associated with schools of public health have more ready access to toxicologists, environmental engineers, industrial hygienists, and others. This does not mean that multidisciplinary approaches cannot happen at smaller institutions; it just takes a highly motivated faculty member. One

such nursing faculty member is Dr. Patty Hale, at Lynchburg College in Virginia (a small, rural liberal arts campus with a school of nursing), who collaborated with an Earth Science faculty member to co-offer a course on environmental health that is a popular elective for nursing students. Few such examples exist of this type of multidisciplinary approach.

At the University of Maryland, undergraduate faculty developed a “mock hearing” that they use to teach students about the multidisciplinary and sometimes adversarial nature of environmental health. Students are assigned “identities” in relation to an environmental health issue and must develop a presentation for a role-playing governor. One semester the subject area was lead poisoning and different student groups were assigned such identities as local health department sanitarians, state housing officials, toxicologists, landlords, parents of lead-poisoned children, and environmental activists.

Environmental Health Content Should Be an Integral Part of Lifelong Learning and Continuing Education for Nurses

Several government agencies, nonprofit organizations, and academic institutions offer professional development programs for nurses in environmental health.

ATSDR has delivered several environmental health workshops for nurses around the country. The agency uses satellite teleconferencing capability to enhance dissemination. Most recently, ATSDR collaborated with HSRA in the distribution of grants to schools of public health that are collaborating with schools of nursing to support professional development for public health nurses in environmental health.

ATSDR has also supported two week-long professional development programs on environmental health for nurses presented by the University of Montana in Bozeman. ATSDR has a cooperative agreement with the Association of Occupational and Environmental Clinics (AOEC), which has created a number of excellent educational materials on a wide range of fairly specific environmental health issues. And finally, ATSDR has created a set of teaching modules with case studies that can easily be integrated into nursing education.

Professional Associations, Public Agencies, and Private Organizations Should Provide More Resources and Educational Opportunities to Enhance Environmental Health in Nursing Practice

In 1990, Congress passed the National Environmental Education Act of 1990 that requires EPA to provide national leadership to increase environmental literacy. Subsequent to passage of this act, EPA established the Office of Environmental Education within the Office of Communications, Education, and Media Relations to implement this program (www.epa.gov/enviroed/pdf/nea.pdf). To date, this office has primarily supported K-12 education. The nursing community should explore future possibilities.

In the past few years, EPA has funded several environmental health and nursing education initiatives. The EPA Office of Air has funded the National Association of School Nurses to provide both a train-the-trainer program and a series of trainings on indoor air pollution in school buildings. The Office of Child Health Protection has funded the American Nurses Association (ANA) and the University of

Maryland School of Nursing to develop a series of independent study modules on children's environmental health (ANA 2001, 2002) Three modules exist both in paper format (distributed to all schools of nursing and ANA members) and as freely accessible online formats. Continuing education credits are offered as an option for those reading the print or online format.

In addition to CEHN, a number of other advocacy players have stepped to the plate to educate nurses about environmental health. The Health Care Without Harm Campaign, which has an active nursing work group, provides a wide range of educational resources including workshops, written materials, videos, and a Web site (www.noharm.org). This international campaign seeks to understand and to improve the environmental health impact of the health care sector. The campaign has inspired a number of new nursing leaders in the field of environmental health.

ANA, through its advocacy role, educates nurses on environmental health. After the passage of the 1997 ANA Resolution on Pollution Prevention, the association created a pollution prevention kit that contains a number of educational tools, including a video (ANA 1998).

In addition to the Kellogg Foundation, two other foundations have provided support for nursing and environmental health. The Bauman Foundation provided a 3-year grant to the University of Maryland to develop expertise (particularly advocacy skills) about safe drinking water and the Beldon Fund just made a grant to the University of Maryland to educate nurses in environmental health advocacy. National environmentalist organizations and foundations are increasingly aware that nurses can play a significant role in environmental health advocacy; however, we must take the time to prepare nurses in the unique skills and content required for environmental health advocacy.

Priority Recommendations

Three priority areas for education were identified during the roundtable meeting:

Support the Creation of Centers for Environmental Health Nursing

Such centers could provide faculty development, graduate education for nurses with an emphasis in environmental health, professional development and continuing education for practicing nurses in the region, and contribute to the development of an environmental health research agenda. The centers should be supported for 4- to 5-year periods.²

Replicate the Faculty Development Program Funded by the Kellogg Foundation

Replication could be implemented in a variety of ways; for example,

- smaller versions to address the needs in one state or a much smaller region that includes all or some of the elements or

²Because no schools of nursing currently have a well-established environmental health research agenda, competition for the grants should not be predicated on past or current work so much as evidence that the institution could develop such an agenda.

- creation of consortia within a state or region to accomplish the work (such consortia could include schools of nursing, schools of public health, state nurses associations, or other combinations of institutions and organizations).³

Create a Web-Based Repository of Environmental Health Education Materials

Every federal, state, and local agency that addresses environmental health issues, as well as hundreds of nonprofit organizations and some for-profit organizations, have created, are creating, or will create educational materials. Unfortunately, many of these materials are duplicative—which means that resources are continually misspent on recreating good environmental health education materials. In the electronic age, there is no excuse for such a waste of limited resources. Electronic versions of environmental health education materials need to be catalogued for easy retrieval and adaptation.

NLM could be responsible for managing such a repository. Materials could be cross-referenced on the basis of content; whether the materials are written for health professionals (faculty or students), patients, or community members; language; and literacy or other purposes. Initially, all federal materials could be catalogued, then the state and local agencies, and finally materials from nonprofit organizations such as the Alliance to End Childhood Lead Poisoning and CEHN. Once cataloguing is under way, gaps would likely be identified, or gaps may arise because of an emerging environmental health threat (e.g., West Nile Virus), and new materials would need to be created to fill the gaps. By developing such a repository, the time that might otherwise be wasted by recreating educational materials would be allocated for educational programs and environmental health interventions.

Roundtable participants believe that many federal programs now in existence could be called on to help realize the recommendations outlined by the nurses and others in attendance at the 2002 roundtable. Therefore, roundtable participants suggest that the next step to be taken is to have an “agency-only” meeting during which officials can identify collective resources to move an environmental health and nursing agenda forward. At least the following agencies should be present: NIEHS, ATSDR, NINR, NCEH (CDC), HRSA, NIOSH, and EPA.

Two things should be identified at such a future meeting of the federal agencies:

- What existing federal resources can be marshaled, both within individual agencies and across agencies? Are there general resources that could be tapped in a targeted manner to achieve the objectives identified at the roundtable?
- Where are there funding gaps to achieving the environmental health and nursing agenda? It is equally important for the nursing community to understand where gaps exist so that it can develop a strategy to fill them.

³It should be noted that the biggest cost for the Kellogg-funded project was travel support for the faculty. Without the travel support, it is highly unlikely that the project would have been as successful. Nursing faculty are rarely provided with substantial travel funding from their home institutions.

Recommendation Outline

Educational Categories

Undergraduate

- Better dissemination of information about successful integration in undergraduate curricula (e.g., Howard University, University of Montana, University of Maryland) via publishing and conferences.
- Develop a set of core environmental health fundamentals for undergraduate curriculum integration and recommendations for points of integration within nursing curricula.
- Disseminate and publish case-based studies for integration into curricula.
- Develop field experiences for undergraduates that illustrate environmental health issues and principles.
- Support the creation of “Green Nursing Schools,” schools that are mercury-free, use integrated pest management, etc. (provide funding, incentives, awards, and more).
- Explore the international nursing community for environmental health materials.

Advanced Nursing (NP), Masters, and Doctoral Levels

- Integrate environmental health into curricula and have “best practices” inform our teaching.
- Provide fellowships.
- Be attentive to the special circumstances under which nurses return to school for advanced education (e.g., working part-time or full-time, family responsibilities).

Practicing Nurses

- Provide continuing education credit for the *Morbidity and Mortality Weekly Report (MMWR)*, as is done for physicians.
- Obtain conference grants for content-specific training (e.g., pesticide exposures in rural areas, indoor air quality in schools).
- Create a clearinghouse for environmental health questions (national or regional “hotlines” from which nurses could derive answers or be referred to experts with regard to particular environmental health issues).

Faculty

- Investigate the new Nurse Reinvestment Act for faculty development support.
- Replicate the Kellogg Faculty Development project in other areas of the United States.
- Obtain conference grants for faculty development.
- Provide creative means of support.
- Participate in fellowships and sabbaticals.
- Perform rotations through NCEH/CDC and other environmental health agencies.
- Follow opportunities for interagency personnel assignment.
- Attend summer institutes.

Overall Dissemination for Academia

- Establish a single-point-in-time collaboration among several major nursing journals on environmental health.
- Create environmental health teaching centers.

Educating Our Patients and Families

- Catalog the existing environmental health educational materials for nursing education, patient education, and community education and participation.
- Identify which of the educational materials have been evaluated for efficacy.
- Create a virtual library of the resources (when electronic versions are available).
- Identify methods of obtaining paper-only versions of educational materials.
- House the virtual library at NLM, in collaboration with NINR, NIEHS, CDC, EPA, and nursing organizations including ANA and nursing subspecialty professional organizations such as AAOHN, Association of Women's Health, Obstetric and Neonatal Nurses (AWHONN), American College of Nurse-Midwives (ACNM), and Association of State and Territorial Directors of Nursing (ASTDN.)
- Catalog these materials on the basis of audience, language (literacy level, foreign language), content, evaluation, and identify gaps and provide funding for the creation of materials to fill the gaps.

Creating Systemic Educational Drivers

- Place environmental health questions on NCLEX and other exams.
- Work with AACN, NLN, and the ANCC.
- Work with the Nursing Organizations Alliance (NOA).
- Work with nursing subspecialty groups that offer certification exams.
- Work with nursing subspecialties to incorporate environmental health into the core competencies for practice.

Contextual Drivers

- Enhance the environmental health content of the JCAHO standard (add environmental health to intake forms).
- Work with MCOs on integration of environmental health into their practices, forms, etc.
- Use occupational health concerns of nurses to raise awareness about environmental health principles and issues.

Additional Suggestions

- Learn from the experience of integrating new skills as scope expands, such as physical assessment into nursing skills.
- Explore and document existing federal funding opportunities that might support some of the abovementioned recommendations.
- Identify where new funding streams would be required and develop a strategy for acquiring them.

Nursing and Environmental Health Roundtable

- Support integration of environmental health into K–12 and higher education.
- Explore possible interfaces with National Nurse Service Corps.
- Support evaluations of the efficacy of nursing involvement in environmental health.
- Partner creatively with other academics, such as clinical pharmacology.
- Continue the *American Journal of Nursing* column and include environmental health issues.
- Publish in *Nursing Advance*.
- Develop 1-year, 2-year, and 5-year goals for this plan.

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Translating Environmental Knowledge Into Nursing Practice

Session Leader: Lillian H. Mood, RN MPH

The growing interest in environmental issues by nurses in every practice arena affirms the focus of the IOM study committee's report on *Nursing, Health, and the Environment* [IOM 1995]. That report emphasized "the role that every nurse can and should play in addressing environmental health issues."

Opportunities and Challenges

The first place changes in nursing practice might be seen is in broadening the scope of assessment by incorporating environmental exposures into every patient's history. No single database tracks whether or how many nurses now routinely ask questions about environmental conditions and exposures. The number of contacts with the University of Maryland's EnviRN Web site (envirn.umaryland.edu/) is a clue to the growing involvement of nurses in environmental issues. Tools like the I PREPARE mnemonic (ATSDR 2001) are in demand and facilitate making assessment of environmental exposures an integral part of nursing care. There are potential ways of tracking the results of such assessments, such as referrals to the AOEC network. Such methods will flow from a more astute awareness and understanding of environmental contributors to health and illness.

Even without documentation in broad databases, common sense tells us that as every primary care nurse begins paying attention to environmental influences on health, not only will care of individuals improve, but a much better picture of the impact of environment on the health of populations and communities will emerge. In a graduate nursing course on Foundations for Community Health, which included environmental content, one student's comment at the end of the course was, "This course really opened my eyes to what is going on right around me! I need to get more involved in my community." This reaction can be expected from many nurses, once their awareness and competence in environmental health are raised.

In addition to supporting the IOM recommendation that every practicing nurse have information on taking exposure histories and be alert to environmental impacts in the practice setting, some specific roles for nurses are fertile ground for incorporating environmental content into practice. Examples of some of these roles follow.

Community and Public Health Nurses

The nurses' presence in the community and the opportunities for multidisciplinary work with environmental experts open many doors. Nurses enriched by environmental knowledge can make an impact on local epidemiology teams. Health education and risk communication messages by public health nurses take on new emphasis when environmental factors are included.

A bold step was taken in Vermont to establish an environmental nurse position in every local public health unit. These nurses can tell their stories of being in the forefront of identifying environmental problems, seeking out assistance from a range of resources, taking action to correct problems, and dealing with the community response to environmental threats to health. The APHA and American

Academy of Asthma, Allergy, and Immunology (AAAAI) annual meeting programs have more presentations each year by nurses involved in environmental issues.

Occupational Health Nurses

Occupational health nurses already have the information on the chemicals used in the industries that employ them. They have the concepts of population health from working with the employee population. Expanding their roles to serve as a link with the neighborhoods and communities surrounding the industry will create a natural bridge. Their expertise can make a difference in sharing information with the industry neighbors and in responding to their concerns.

School Nurses

School nursing presents many of the same opportunities as public health and occupational health does. In addition, school nurses have access to one of the most vulnerable populations for environmental exposures. With additional knowledge, school nurses can not only make a difference in the health of families by including environmental health content in their health teaching and communication, but they can also be identifiers of early evidence of health problems with environmental contributing factors and sentinel cases of illness with environmental implications.

Parish Nurses

In many communities, parish nurses have become the equivalent of the historic neighborhood nurse. Their populations of concern often include the community surrounding the church as well as members of the congregation. Their presence out in the community and in homes with a cross-section of age groups and socioeconomic conditions can be invaluable in prevention of environmental health problems and early identification and action. They are also in good positions to mobilize community action to address environmental hazards.

Emerging Environmental Health Nursing Activities

Finally, some new areas exist where nurses can offer their services and expertise. Some examples follow:

- Serving as environmental health consultants to individuals, to work settings, and to professional groups.
- Conducting “windshield surveys” of rural communities to determine boundaries of affected and “worried well” population (for example, to inform them of a chemical spill or a leaking underground storage tank).
- Listening at kitchen tables, neighborhood meetings, and rural churches to stories of concern for illness in communities or unusual sights, odors, tastes that might signal environmental problems.

- Arranging for “safe spaces” where citizens can connect with environmental and health experts and explore concerns, share information, and work together to improve community conditions.
- Working with citizens and their associations to plan how to get information to communities in ways and language that fit their needs.
- Facilitating large public forums to give the community a voice when environmental problems or new initiatives affect a broad range of neighborhoods and interest groups.
- Making home visits to families whose lives are disrupted by environmental investigations and clean up of contaminated sites, explaining what is going on to prevent unnecessary fear and to equip them to deal with the issues.
- Speaking up in public meetings, writing letters, making written comments on policy initiatives and community developments that could impact the environment, and quality of life, in positive and negative ways.
- Being a reliable and trusted source that citizens can count on to be accessible, to respond, to give accurate information, to find the right persons to help, and to follow through on promises and commitments.

In addition, environmental protection agencies can hire nurses in community liaison roles to bridge the communication gaps among citizens, environmental scientists, and health professionals. Basing nurses in the environmental protection programs of a state regulatory or public health agency would open up new opportunities for the nursing profession. Some nurses are truly developing into environmental experts, working in federal agencies like EPA, and CDC, and in clinical settings such as occupational and environmental clinics. Colleagues from other disciplines have come to value the wisdom of nursing expertise in clinical decisions, policy discussions, and educational initiatives.

Nurses in new environmental roles can demonstrate their value by publishing in nursing and nonnursing journals and in the popular press. Speaking engagements and workshops can also get the word out about new nursing opportunities. Cable TV, local radio talk shows, and columns in newspapers, especially weeklies, are other means of raising awareness and building support for these new roles for nurses.

Roles for Nurses in Their Communities

Nurses have taken citizen leadership roles in their own communities when environmental concerns spurred them to action. One nurse led a grass-roots initiative for a state air toxics law. She was also instrumental in (a) developing an EPA-directed agreement with a local industry that resulted in additional research on health effects of a chemical used as raw material in their operations, (b) establishing a community advisory group, and (c) instituting an information line for the public. Another nurse chaired the advisory group for a state health department study of cancer in her community. Yet another nurse organized her community to successfully oppose building a cement

plant in a rural residential area while the county was in the midst of finalizing its land use regulations. Other nurses have served on citizen panels for federal nuclear plant sites.

Retirement does not lessen opportunities for nurses. Elected, appointed, and volunteer advocacy opportunities are available to make communities more environmentally sustainable and healthier with adequate public transportation, walking and biking paths, preservation of trees and green spaces, and land use planning and zoning. Nurses can be active in all of these issues and projects.

Environmental health is a rapidly emerging nursing practice arena. As the number of environmental health champions grows in the nursing profession, the excitement and energy they generate will draw others in. One challenge is to give more visibility to the success stories so more nurses, environmental professionals, government agencies, industries, and the public will recognize that nurses in environmental health, as in all areas of practice, truly make a difference.

Recommendations

General Strategies

- Develop ways for nurses to integrate environmental health in student practice experiences, current practitioner clinics, and public health.
- Develop guidelines for community practice on engagement, collaborative process, shared decision making, and information dissemination.
- Enlist community leaders and environmental experts who can speak to nurses about environmental health issues and interventions.
- Encourage local nurses to get to know their environmental colleagues (e.g., EPA as well as state and local agencies).
- Conduct media campaigns to promote the visibility of nurses in environmental health.
- Do staff development at state and local level on integrating or enhancing environmental health in current practice.
- Develop mechanisms for providing continuing education on environmental health for practicing nurses. Consider “boot camp for nurses” (intensive immersion experiential learning in a concentrated time).
- Enhance and legitimize the role of nurses in educating and empowering community members in being vigilant about real and potential environmental problems and strategies for redress.
- Lobby for funding for improved infrastructure for public health nursing, especially environmental health in nursing.
- Provide risk communication training, especially for nurses working in community and public health.
- Link with other groups, like the Environmental Health Section of APHA.

Implementation of Existing Resources

- Make nursing settings more environmentally healthy: increase awareness of current adverse environmental features of practice (e.g., the presence of mercury-containing equipment, other supplies and practices that are not environmentally friendly) and work to change the norm.

- Inform and link nurses with the Hospitals for a Healthy Environment project (www.h2e-online.org/).
- Launch a major initiative to familiarize every registered nurse, starting with those in public health, with the I PREPARE mnemonic.
- Use I PREPARE in every setting where health histories are taken.
- Integrate environmental health history-taking as a core component of nursing practice.
- Expand the capacity of the poison control centers to provide consultation to practicing nurses.
- Inform practicing nurses of resources such as the EnviRN network, NLM databases, NIEHS, ATSDR, and EPA materials and assistance.

Resources To Be Developed

- Request from national nursing organizations identification of nurses doing research, education, and practice in environmental health (i.e., specifics such as name, contact information, funding source).
- Modify some common nursing assessment tools to include environmental health (women, children, adult, building assessments).
- Create quick reference tools for practicing nurses.
- Identify individual and organization models that are practicing environmental health.
- Conduct meetings to present evidence-based environmental health nursing practice.
- Review and include generic assessment tools with environmental and occupational screening questions implemented by ASTDN's public health nurses.
- Provide case studies on the impact of research on practice of practicing nurses.
- Outline multilevel intervention approach in specific environmental health problems: individual, family, community, and sociopolitical.

Clearinghouse

- Create an online clearinghouse of educational materials identified and available for practicing nurses.
- Establish a clearinghouse for research and increase availability of research outcomes to practitioners.

Publications

- Publish environmental health resources to assist practitioners and provide CE credits for environmental health content.
- Publish environmental health-related content in key journals.
- Assemble a small list of key environmental health resources for practicing nurses to begin to explore environmental health issues and how they impact nursing practice in all settings and disseminate this list through nursing organizations and publications.
- Present environmental practice experiences at APHA and post abstracts online.

Partnerships

The following groups could be brought together to increase awareness of nursing and environmental health:

- JCAHO and other credentialing organizations (to leverage practice sites to implement environmental health tools and standards).
- State and local environmental staffs.
- Environmental studies in local universities and community colleges.
- Community and national environmental advocacy groups.
- Federal agencies with environmental responsibilities and resources.

Barriers

- The time necessary to be proactive on environmental health-related fronts.
- Difficult or problematic access to environmental health colleagues or environmental databases.
- Widely dispersed practice population.
- Lack of “champions” for environmental health in nursing management.

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Summary and Recommendations

The roundtable organized by ATSDR, NIEHS, and NINR was highly successful in bringing together an exceptional group of individuals from nursing organizations and academic institutions, as well as environmental and public health agencies, for dynamic and productive discussions on areas for possible collaboration in environmental health nursing. Although discussions covered a range of possibilities, the group identified several specific projects for future emphasis. Following are the priority recommendations for continuing advances in environmental health nursing; these recommendations might apply to more than one of the focus areas of research, education, and translation to practice.

Research

- Developing an environmental health nursing research agenda that identifies specific research topics, defines research goals, and establishes research priorities.
- Creating environmental health nursing research centers or centers of excellence to foster expertise in research, faculty, and clinical practice.
- Showcasing important environmental health research advances in existing journals.
- Establishing a journal specifically focused on nursing and environmental health.
- Increasing communication and collaboration among federal agencies with a shared interest in environmental health nursing.
- Identifying and developing new funding sources and mechanisms to support environmental health nursing research.

Education

- Defining best practices for environmental health nursing to facilitate academic use in nursing education at all levels.
- Forming collaborative partnerships with key groups and organizations to advance the incorporation of environmental health into nurses' core competencies, licensure examinations, and textbooks.
- Identifying and developing new funding sources and mechanisms to support environmental health nursing education.

Translation to Practice

- Creation of a centralized clearinghouse to catalog and facilitate access to environmental health education materials, curricula, and research in an effort to raise awareness and serve as a means of monitoring progress in environmental health nursing at all levels.
- Creating more reference tools for use in the practice settings.
- Identifying and developing new funding sources and mechanisms to support environmental health nursing practice.

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At the close of the roundtable, a follow-up meeting of key federal agencies was proposed. This meeting will include additional federal agencies, such as EPA, Indian Health Service (IHS), and others. The follow-up meeting is tentatively planned for spring 2003. The focus of this meeting is to begin implementation of the priority recommendations by identifying existing programs and forming appropriate partnerships. In addition, this meeting will also serve to identify gaps in existing programs and outline possible options for securing support to address those gaps.

A reference materials section pertaining to nursing and environmental health is included in this roundtable report and is also available on the Environmental Health Nursing Roundtable Web site (www.niehs.nih.gov/translat/nurse-rt.htm).

Meeting Agenda

Day 1: August 26, 2002

North Carolina Conference Room

7:30	Packet Pick-up	
	Welcome & Introductions	Liam O'Fallon, NIEHS
8:00	Welcome: NIEHS	Samuel Wilson, NIEHS
8:15	Welcome: ATSDR	Elizabeth H. Howze, ATSDR
8:30	Welcome: NINR	Janice Phillips, NINR
8:45	Background Meeting format Goals & Anticipated Outcomes	Teresa Nastoff, ATSDR
9:00	Session Presentations a. Research (15 min) b. Education (15 min) c. Translation to Practice (15 min)	Session Leaders Linda McCauley Barbara Sattler Lillian Mood
10:00	Break (15 min)	
10:15	Breakouts a. Research b. Education c. Translation to Practice	Rooms: Raleigh & Durham A & B Linda McCauley Barbara Sattler Lillian Mood
	<i>Session Leaders will guide breakout discussions with a goal of identifying a next steps and recommendations that could be used by ATSDR, NINR and NIEHS.</i>	
12:15	Lunch	
	<i>The following session summaries are designed to engage all roundtable participants. Each breakout group will summarize their recommendations to the whole group to begin discussion. (Times are approximate.)</i>	
1:15	Research Summary a. Recommendations (10 min) b. Discussion (45 min) c. Summary (5 min)	North Carolina Conference Room

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- 2:15 Education Summary
a. Recommendations (10 min)
b. Discussion (45 min)
c. Summary (5 min)
- 3:15 Break (15 min)
- 3:30 Translation to Practice Summary
a. Recommendations (10 min)
b. Discussion (45 min)
c. Summary (5 min)
- 4:30 Synthesis of Day, Outline for Tomorrow Diane Drew, ATSDR
- 4:45 Adjourn for Day

Day 2: August 27, 2002

North Carolina Conference Room

- 8:30 Session Summaries Session Leaders
Session Leaders will synthesize the major points of discussion from the breakout as well as the full roundtable. These 30 minute summaries should emphasize the recommendations of the group.
a. Research
b. Education
c. Translation to Practice
- 10:00 Break
- 10:15 Other Issues Open Discussion
There are many other areas of importance related to nursing and environmental health beyond the three themes identified for the purposes of this meeting. If NINR, ATSDR and NIEHS were to host a similar meeting in the future, what topics would you recommend? Why?
- 11:15 Synthesis Liam O'Fallon, NIEHS
- 11:30 Adjourn
- 12:00 Working Lunch with Session Leaders Program Staff & Session Leaders
Purpose: to discuss next steps and timeline for final session report.
- 2:00 Adjourn

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Books and Technical Reports

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Nursing and Environmental Health Roundtable

