

Health Care Provider Initiative Strategic Plan

Introduction

This document lays out the strategy for achieving the goals and objectives of the National Environmental Education Foundation's (NEEF) *Health Care Provider Initiative*. The goal of NEEF's *Health Care Provider Initiative* is to incorporate environmental health into health professionals' education and practice in order to improve health care and public health, with a special emphasis on protecting children and other populations disproportionately affected by environmental pollutants.

The strategic plan is based on the National Strategies for Health Care Providers: Pesticides Initiative Implementation Plan¹, which was developed by experts as a model that can be applied to other environmental health issues and was built upon the Institute of Medicine reports recommending the integration of environmental health issues throughout training and clinical practice for health care providers.^{2,3,4}

Making the Case

With the widespread presence of environmental health hazards in our communities and in our world, health professionals must be prepared to diagnose, treat and prevent health conditions related to environmental exposures in their patients and communities. The public expects their health care providers to be prepared to deal with health problems related to environmental health hazards, but all too often providers are not equipped to respond effectively.

Environmental health is defined as "freedom from illness or injury related to exposure to toxic agents and other environmental conditions that are potentially detrimental to human health."⁵ Poor environmental quality is estimated to be directly responsible for approximately 25% of all preventable ill health in the world.⁶ In 1998 and 1999, 80% of crop farms and 74% of households used pesticides.⁷ In 2001 nearly 40% of American children lived in counties that exceeded the eight-hour ozone standard at least one day.⁸ In the U.S., the rates of asthma increased 73.9% during 1980-1996.⁹ The total costs of environmentally-attributable diseases in American children are estimated at \$54.9 billion annually.¹⁰ To address the broad range of environmental health issues, such as outdoor and indoor air quality, water quality, hazardous waste and toxics, Healthy People 2010 includes several environmental health objectives and highlights the critical role of health care providers in health education and health promotion.^{1,11}

The need for improvements in health professionals' environmental health knowledge has been expressed by leading health institutions. The Institute of Medicine recommends the integration of environmental health concepts into all levels of medical and nursing education.^{5,12} The American Medical Association encourages physician educators in medical schools, residency programs, and continuing medical education sessions to devote more attention to environmental health issues and encourages physicians to educate themselves about pesticide-related illnesses.^{13,14} The

American Academy of Pediatrics encourages pediatricians to become informed about air pollution problems in the community and published a book on the identification, prevention, and treatment of childhood environmental health problems.^{15,16} The American College of Preventive Medicine has urged funding and support for the Agency for Toxic Substances and Disease Registry in their efforts to educate health care providers on toxic substances and how to prevent exposure to these substances.¹⁷ The Academic Pediatric Association has established the National Fellowship Program in Pediatric Environmental Health and proposed competencies for pediatric environmental health specialists.¹⁸ The U.S. Department of Health and Human Services Division of Nursing has included the ability to recognize environmental health problems affecting patients and provide health protection interventions as one of the essential primary care nurse practitioner competencies.¹⁹ Finally, the American Nurses Association has resolved to broaden its work in occupational and environmental health and apply the precautionary approach when an activity raises threats of harm to human health or the environment.²⁰

A survey of environmental medicine content in U.S. medical schools found that 75% of medical schools require about seven hours of study in environmental medicine over four years, and a survey of Migrant Clinician Network clinicians found that approximately half had not had any training or courses related to environmental and/or occupational health.^{21,22} According to NEEF's "Incorporating Environmental Health into Pediatric Medical and Nursing Education" study, published in *Environmental Health Perspectives*, two expert groups concluded that health professionals need more training in environmental health and assessed the medical and nursing education structures to identify key leverage points for curricular change.²³ A second NEEF study "Educational Needs Assessment for Pediatric Health Care Providers on Pesticide Toxicity" assessed the current environmental health and pesticides knowledge of primary care providers and how they would best respond to educational programs and information resources. The study concluded that a majority of primary health care providers are not equipped to answer patient questions about pesticides or ask patients about possible pesticide exposure.²⁴ A survey of chief residents of U.S. pediatric residency programs found that fewer than half of pediatric programs routinely include pediatric environmental health issues in their curriculum, other than lead poisoning and environmental exacerbation of asthma.²⁵ A majority of nurse practitioner program directors stated there should be greater emphasis on environmental health in their programs; and a majority of medical school deans and family practice residency directors believed moderate emphasis on environmental health in their programs would be ideal.^{26,27,28} After physicians attended an interactive asthma seminar, children seen by these physicians experienced fewer hospitalizations and fewer subsequent emergency department visits.²⁹ NEEF's study based on a health professional training program, entitled "Children's Environmental Health Faculty Champions Initiative: A Successful Model for Integrating Environmental Health into Pediatric Healthcare" concluded that the Faculty Champion model is a highly effective, successful, and replicable method for achieving environmental health education and integration.³⁰

Health professionals and other stakeholders participating in the National Forum for the *National Strategies for Health Care Providers: Pesticides Initiative*, organized by the National Environmental Education Foundation, agreed that addressing environmental health conditions should be part of routine primary care and recommended the creation of a position statement

which documents the need for environmental health education and lists the specific actions necessary to successfully incorporate environmental health information into the education of health care providers, especially for physicians, nurse practitioners, physician assistants, nurses, nurse midwives, and community health workers, who work at the frontline of the health care system.³¹ National Forum participants contributed to the development of NEEF's Health Professionals and Environmental Health Education Position Statement, which has been officially endorsed and supported by 34 leading health professional organizations.³²

Target Audience

The target audience for this initiative is the primary health care provider. Primary care providers work at the frontline of our health care system and need to be able to identify a possible environmental exposure. It is recommended that all primary care providers possess basic knowledge and skills related to environmental exposures. A primary care provider, for the purpose of this Initiative, is defined as: A physician, nurse, nurse practitioner, physician assistant, nurse midwife, or community health worker specializing in one of the following areas: family medicine, internal medicine, pediatrics, obstetrics/gynecology, emergency medicine, preventive medicine, or public health. Specialists in occupational and environmental medicine, allergy and immunology, pulmonology, and medical toxicology are not the primary target of this Initiative. They are seen as resource professionals for the primary care providers. In addition to these primary care providers, the target audience also includes key decision-making bodies in the health professions. A decision-making body refers to any organization, institution, or individual leader that is vested with decision-making authority for the education and practice of health care providers. The engagement of or endorsement by such bodies is critically important for the success of the Health Care Provider Initiative.

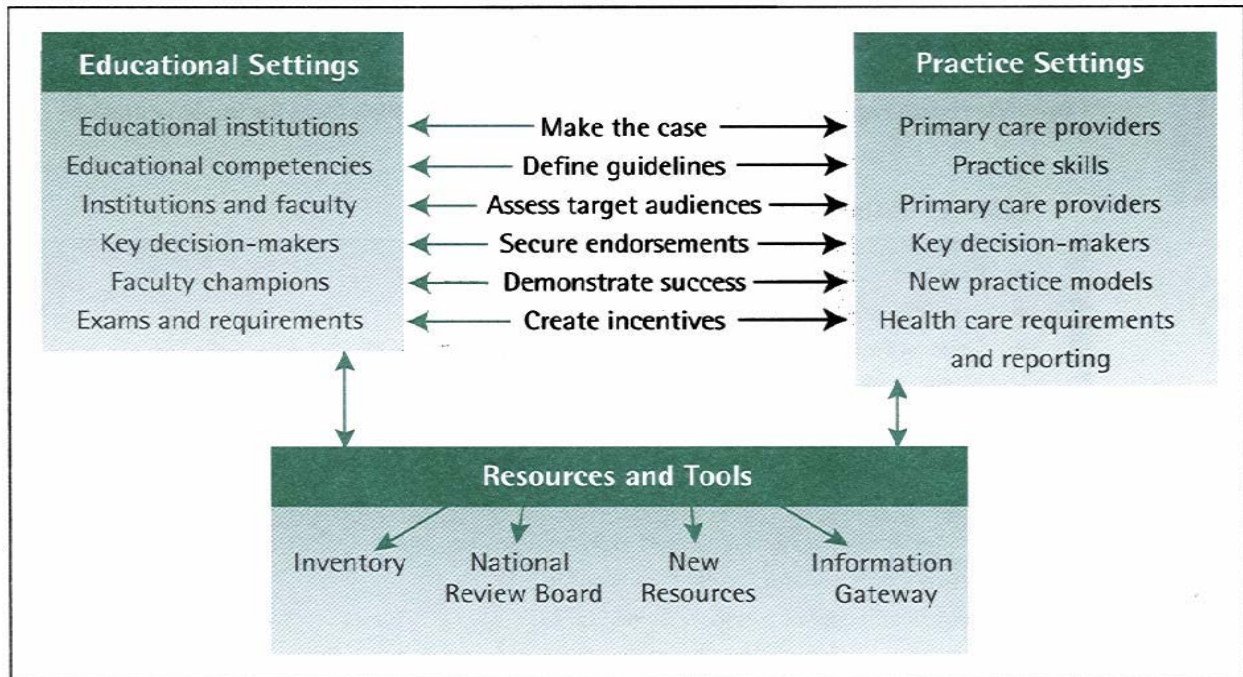
Primary Health Care Providers

Physicians
Nurses
Nurse Practitioners
Physician Assistants
Nurse Midwives
Community Workers Care & Health Practice/Requirements

Decision-making Bodies

Curriculum Committees
Accrediting Institutions
Administrators
Residency Review Committees
Institutions Governing Health

Framework of the Plan: A Three-Pronged Strategy



Educational Settings

The first prong of the strategy is directed at the educational setting. Educational settings, for purposes of this Initiative, are defined as medical schools, nursing schools, academic health centers, training programs for all levels of nursing education, and medical residency programs. While the components target the educational setting, they also involve the professional associations and decision-making bodies that represent and/or influence the educational setting. These include, for example, the Association of American Medical Colleges, the American Association of Colleges of Nursing, the Association of Academic Health Centers, and the Accreditation Council for Graduate Medical Education. The following components come from across the continuum of systemic change — from raising awareness and assessment, to development of core competencies, to the support of and model programs.

Education Component A: Make the Case for Change in Educational Settings

Develop an effective case statement to convince administrators, faculty, and students about the need for environmental health education in medical and nursing education.

Desired Outcomes

_ A written case statement that documents the key reasons why faculty members and administrators of academic institutions should be aware of environmental-related health conditions, using persuasive data and documentation from the scientific literature, and stressing the importance of teaching environmental health in their educational curriculum.

- _ Endorsement by leading national professional associations, national bodies, deans, and faculty committees.

Stakeholders

- _ Professional associations
- _ Key accrediting bodies
- _ Curriculum committees
- _ Deans/Department chairs
- _ Collaborating federal agencies

Evaluation of Outcomes/Indicators of Success

- _ Complete case statement.
- _ Published articles in professional journals and newsletters.
- _ Position papers developed and adopted by professional associations.

Education Component B: Define Competencies and Integration Strategies for Curricula

Produce National Guidelines that recommend competencies specific to the recognition, management and prevention of environmental exposures, for all basic and advanced training in medicine and nursing; define accompanying content areas; suggest methods of integration into curricula; and provide access to relevant resource materials.

Desired Outcomes

- _ National environmental health competency guidelines for education that recommend competencies, content, insertion points into curricula, and resources.
- _ Endorsement of national guidelines by leading national professional associations.

Stakeholders

- _ Academic institutions
- _ National professional associations for academic institutions
- _ Faculty members who have already developed curricula

Evaluation of Outcomes/Indicators of Success

- _ National Guidelines completed and peer reviewed.
- _ Endorsement by key stakeholder organizations.

Education Component C: Assess Educational Settings

Conduct an assessment of the target audience of educational institutions to determine: (a) amount of existing coursework, (b) faculty members' current knowledge and skill levels, and comfort with teaching environmental-related topics, and (c) how faculty and educational institutions will best respond to educational programs and information resources. This assessment will be comprised of a literature review and a range of needs assessment analyses.

Desired Outcomes

Baseline data indicating the level of education currently taking place in academic institutions, current curricular content and emphasis on environmental health, current knowledge of teaching

faculty, and best mechanisms to reach and train faculty to teach.

Stakeholders

- _ Professional associations that represent academic institutions
- _ Academic institutions
- _ Faculty curriculum committees
- _ Faculty members
- _ Students

Evaluation of Outcomes/Indicators of Success

- _ Comprehensive literature search documenting the findings of studies that have surveyed academic institutions and deans.
- _ Report with baseline data, conclusions, and recommendations.

Education Component D: Secure Official Endorsements

Ensure the integration of the core competencies outlined in the National Guidelines into educational institutions by securing the official endorsements and support of key professional organizations and decision-making bodies.

Desired Outcomes

Professional organizations, licensing and accrediting bodies, administrators, and educators will agree that these competencies are essential to the education of primary care providers and will integrate or support their integration into core curricula.

Stakeholders

- _ Professional specialty organizations, licensing boards, accreditation/certification bodies
- _ National professional associations

Evaluation of Outcomes/Indicators of Success

- _ New position papers by targeted organizations that support the integration of recommended environmental health content into curriculum.
- _ New requirements by professional decision-making bodies that require institutions to teach about health effects from environmental exposures.
- _ Published journal articles in professional newsletters and peer-reviewed journals.

Education Component E: Strengthen and Build Faculty Champions

Create and support faculty champions within medical and nursing schools to teach environmental health in the curriculum, and to bring about change within their institutions. A champion, for purposes of this Initiative, is defined as a faculty member who takes a leadership role in integrating environmental health into his/her institution in a sustainable fashion. This component is designed to ensure that a strong cadre of faculty champions is developed across the country who will lend expertise and support for this effort in their institutions and surrounding communities.

Desired Outcomes

_ Funding of 146 faculty champions, including one faculty champion in all 126 academic health centers in the United States, plus an additional 20 faculty champions in 20 other higher education institutions to ensure a balance of medicine and nursing faculty as well as representation from diverse institutions.

_ Additional support for 10 of the academic health centers to serve as regional technical assistance centers.

Stakeholders

- _ Collaborating federal agencies
- _ Key association for health professional schools
- _ National coordinating body

Evaluation of Outcomes/Indicators of Success

The entire component will be evaluated based on the following indicators:

Project Outcomes (1-5 year funded project)

- _ 146 institutions with documented integration of environmental health into curriculum.
- _ 146 institutions with increase in students' basic knowledge and skills in environmental health.
- _ 146 institutions with increased FTE time devoted to environmental health.
- _ Increase in number of practice/field experiences in environmental health sites
- _ Increase in environmental health research activities.

Project Outcomes (post 5-year project)

- _ Increase in new researchers investigating environmental health.
- _ Increase in number of primary care providers out of the pipeline who address environmental health in practice and research.
- _ Sustainable institutional change in majority of 146 institutions.
- _ Changes in the way health professionals address environmental health (measure of overall effectiveness).

Education Component F: Create Teaching Incentives Strategy

Influence the appropriate boards, organizations, and institutions that create Board exams and set curriculum requirements to include several key competencies on environmental health.

Desired Outcomes

- _ Questions on Board exams
- _ Changes in curriculum requirements

Short-term Priorities

Medicine

- _ United States Medical License Examination (Steps 1, 2, 3)
- _ Board Examinations in Family Practice, Pediatrics, Internal Medicine, Ob/Gyn, Emergency Medicine

Nursing

- _ AANC generalist examinations
- _ Nurse practitioners — adult, pediatrics, family, gerontological (ANP, PNP, FNP, GNP)
- _ Nurse midwives — American College of Nurse Midwives (ACNM)
- _ Clinical nurse specialists (CNS)

Longer-term Priorities

- _ Physician Assistants
- _ Pharmacists
- _ Basic Nursing
- _ Genetic Counselors

Stakeholders

- _ Key national decision-making bodies for curriculum changes, requirements, and examinations
- _ National professional association
- _ Key federal agencies involved with health profession education
- _ Faculty members

Evaluation of Outcomes/Indicators of Success

- _ Increase in the number of questions in the examination pool and on each examination as compared with the initial assessment.
- _ Changes in requirements for primary care disciplines (pediatrics, family practice, internal medicine, preventive medicine/public health, emergency medicine and obstetrics and gynecology) to include environmental health.

Practice Settings

The second prong of the strategy is the practice setting. Practice settings, for purposes of this Initiative, are defined as community health centers and clinics; managed care clinics; hospitals and emergency departments; private practices; urgent care centers; poison control centers; and work and/or school-based clinics. While the components target the practice setting, they also involve the professional associations and decision-making bodies that represent and/or influence the practice setting. The following components apply across the continuum of systemic change — from raising awareness and assessment, to development of expected practice skills, to the support of “model practices” and system-wide incentives.

Practice Component A: Make the Case for Practitioners

Develop an effective case statement to convince primary care providers of the need to incorporate occupational and environmental health into their practice settings.

Desired Outcomes

- _ A written case statement that documents the key points of why practicing health care providers should care about the environments in which their patients live and work, especially with regards to potential environmental poisonings and exposures, along with the accompanying scientific literature to support the need for well educated health care providers. This statement will be linked with the case statement for educational settings.
- _ Endorsement of the case statement by leading national professional associations and national bodies that work with practitioners.

Stakeholders

- _ Professional associations
- _ Recertification bodies

- _ Continuing education organizations
- _ Collaborating federal agencies

Evaluation of Outcomes/Indicators of Success

- _ Case statement.
- _ Published articles in professional journals and newsletters.
- _ Position papers developed and adopted by professional associations.

Practice Component B: Define Practice Skills and Guidelines

Produce National Guidelines that recommend practice skills and guidelines for the recognition, management, and prevention of environmental exposures, for all practicing health care providers; define accompanying content related to expected behavior; suggest methods of integration into practice and training settings; and provide access to relevant resource materials.

Desired Outcomes

- _ National Environmental Health Practice Skills Guidelines which recommend practice skills, content, insertion points into practice and training settings, and resources.
- _ Endorsement of National Guidelines by leading national professional associations.

Stakeholders

- _ National professional associations for practicing primary care providers
- _ Practicing health care providers who have already developed tools and practice models

Evaluation of Outcomes/Indicators of Success

- _ The National Guidelines will include defined practice behaviors, content areas, insertion points, examples as necessary, and recommended resources.
- _ Endorsement by key professional organizations for providers.

Practice Component C: Assess Knowledge and Skills of Practitioners

Conduct an assessment of the target audience of primary care providers to determine: (a) providers' current knowledge; and (b) how providers will best respond to educational programs and information resources. This assessment will be comprised of a literature review and a range of needs assessment analyses.

Desired Outcomes

Baseline data indicating the level of training currently taking place in practice settings, current knowledge of practicing providers, and identification of best mechanisms to reach and train providers, and to equip them with user-friendly tools.

Stakeholders

- _ Professional associations that represent practitioners
- _ Continuing education programs, organizations that offer continuing education
- _ Practicing clinics and health care delivery systems
- _ Practicing providers

Evaluation of Outcomes/Indicators of Success

- _ Comprehensive literature search documenting the findings of studies that have surveyed practicing primary care providers.
- _ Report with baseline data and conclusions/recommendations.

Practice Component D: Secure Official Endorsements

Ensure the integration of the expected practice skills into practice settings by securing the official endorsements of key professional organizations and decision-making bodies.

Desired Outcomes

Professional organizations, influencing bodies, and practitioners will agree that the expected practice skills are essential to the ongoing training of primary care providers and will integrate or support their integration into practice settings.

Stakeholders

- _ Professional specialty organizations
- _ Licensing boards
- _ National professional associations

Evaluation of Outcomes/Indicators of Success

- _ New position papers by targeted organizations that support the integration of recommended environmental health content into practice settings.
- _ New requirements by professional decision-making bodies that require professional education to teach about health effects from environmental exposures.
- _ Published journal articles in professional newsletters and peer-reviewed journals.

Practice Component E: Demonstrate Model Programs

Mobilize practice settings to become population-specific and to incorporate environmental considerations into prevention, education, diagnosis, and treatment. Achieve incremental, site-specific improvements in identification, early intervention, and prevention, as well as in measures of practice-specific health outcomes.

Desired Outcomes

- _ Demonstration projects (distributed geographically across the United States) that model practice settings where environmental-related health conditions are an integrated part of the provision of care and community outreach.
- _ Evaluation of demonstration models and creation of a “models that work” guide for the field and other practice settings.
- _ Creation of a tool kit that can be used by other practice settings that want to set up a model program.
- _ Launching of nationwide effort to redesign practice settings.

Stakeholders

- _ Professional associations
- _ Practice settings

- _ National coordinating organization
- _ Funding agencies and partners
- _ Organizations that have created practice change models

Evaluation of Outcomes/Indicators of Success

- _ Funding secured for pilot program.
- _ Chosen sites underway in developing practice models.
- _ Five to ten practice change models with evaluation components and identified success stories.
- _ Publication of model programs.
- _ Effective dissemination of practice models nationwide.
- _ Enhanced reporting of acute environmental exposure-related illness cases.

Practice Component F: Create Incentives for Change

Identify and promote a number of incentives to incorporate appropriate prevention, recognition, and management of environmental-related health conditions into health care practices. Specifically facilitate the realization of the following: (1) grant funding to practicing providers for interventions and research related to environmental poisonings and exposures; (2) free and readily available opportunities for continuing education involving environmental health; (3) increase in providers' awareness of the value of taking an occupational and environmental history for optimizing Evaluation and Management (E&M) coding and billing; (4) requirements for knowledge of environmental health issues for certification and re-certification; (5) requirements for environmental poisoning reporting for workers' compensation reimbursement and automatic workers compensation reimbursement for workup of suspected occupational environmental-related health conditions; and (6) promotion of documentation of occupational and environmental history in medical records, via incorporation into quality assurance/quality control mechanisms.

Desired Outcomes

- _ Increased attention paid by primary care providers to environmental poisoning and exposures based on incentives to change practice.
- _ Creation of new or improved incentives in the following areas: monetary incentives; legal incentives; community-based incentives; and peer/professional incentives.

Stakeholders

- _ Federal agencies and foundations that support research and interventions
- _ Professional associations
- _ NIOSH Educational Resource Centers
- _ Health care centers and hospitals
- _ Community clinics
- _ Worker's compensation partners

Evaluation of Outcomes/Indicators of Success

- _ Increase in number of grants and level of support available to practicing primary care providers.
- _ Increase in publications of research findings and interventions undertaken by providers.
- _ Report on success stories and lessons learned in the field.

- _ Adoption of models in other settings.
- _ Increase in number of continuing education offerings.
- _ Increase in number of people attending continuing education programs and number of people completing web-based credits (percentage increase in participation each year).
- _ Short-term and long-term changes in Evaluation and Management coding and workers' compensation.
- _ Questions added to recertification exams of professionals.
- _ Quality assurance/quality control mechanisms in targeted health care organizations are changed to incorporate review of documentation of an occupational and environmental history.

Resources and Tools

Resources of all kinds serve as the “infrastructure” for this Initiative. The five resource components are designed to identify, create, and disseminate the necessary tools to support change in both educational and practice settings. Key concerns are to avoid duplication of existing resources by inventorying the current stock of resources available, and to ensure the scientific credibility and usefulness of resources by establishing a national review board to evaluate them.

Resource Component A: Inventory Existing Resources

Determine what educational and information programs and materials for health care providers exist in education and practice settings and what gaps should be filled.

Desired Outcomes

An inventory of environmental health resources based upon information from health care providers in education and practice settings.

Stakeholders

- _ Planning Committee for this Initiative
- _ Organization conducting the inventory

Evaluation of Outcomes/Indicators of Success

- _ Inventory completed and available.
- _ Feedback from website users indicating additional resources and/or identifying gaps.
- _ Acknowledgment of a thorough inventory by the national review board.

Resource Component B: Establish National Review Board to Evaluate Resources

Create a national body to determine assessment criteria and evaluate existing resources, with the goal of identifying, selecting, and assessing the ideal resources that primary health care providers use in both educational and practice settings for prevention, diagnosis, treatment, and referral of environmental-related health conditions.

Desired Outcomes

- _ An established board available for ongoing consultation and review.
- _ A published document with a list of evaluated and recommended environmental health

resources that primary health care providers can use in both educational and practice settings for prevention, diagnosis, treatment, and referral of environmental exposures.

Stakeholders

- _ Planning Committee
- _ National review board members

Evaluation of Outcomes/Indicators of Success

- _ Published resources document, online and in print format.
- _ Feedback from health care providers on the usefulness of the resource list.

Resource Component C: Create an Information Gateway

Establish a print, telephone, and web-based gateway through which primary health care providers can access information and educational resources.

Desired Outcomes

A fully functional, interactive, information gateway that provides primary health care providers with access to readily available and useful environmental health resources.

Stakeholders

- _ Planning Committee
- _ Organization to manage the gateway

Evaluation of Outcomes/Indicators of Success

- _ Number of requests for information.
- _ Number of pageviews and downloads from the website.
- _ Number of calls.
- _ Customer satisfaction feedback on the website.
- _ Feedback from focus groups.
- _ Degree to which the dissemination efforts are nationwide.
- _ Degree to which dissemination efforts and resources address primary health care providers at varying stages of change.

Resource Component D: Develop Teaching/Learning Resources for Educational Settings

Identify and develop new content resources, tools, and methods for faculty to use in educational settings.

Desired Outcomes

- _ Teaching modules
- _ Network of experts and organizations nationwide

Stakeholders

- _ Faculty who have already developed resources
- _ Key professional associations for faculty
- _ State lead agency environmental health educators

Evaluation of Outcomes/Indicators of Success

- _ New resources are approved and endorsed by the national review board.

Resource Component E: Develop New Resources for Practice Settings

Identify and develop new content resources, tools, and methods for health care providers in practice settings.

Desired Outcomes

Increased access to and availability of relevant information and resources including experts in the field, content materials and available data within communities.

Stakeholders

- _ Faculty who have already developed resources
- _ Key professional associations for faculty
- _ State lead agency environmental health educators

Evaluation of Outcomes/Indicators of Success

- _ Increased utilization of community resources.
- _ Increased number of customized educational programs/materials.
- _ Increased number of resource collaborations.
- _ Number of RFPs related to new and innovative ways to get information to primary care providers.
- _ Increased number and frequency of environmental health practice related publications.
- _ Increased number of CE courses.
- _ Increased number of presentations in practice settings.
- _ Numbers of policy statements.
- _ Numbers of re-certification exams.
- _ Numbers of questions on exams.
- _ Increased availability of reimbursement mechanisms.
- _ Number of people applying for Certificate of Recognition.
- _ Number of requests made of experienced professionals.
- _ Number of professionals who agree to participate.
- _ Diversity of professional background.

References

¹ The National Environmental Education & Training Foundation (NEETF). Implementation plan: National strategies for health care providers: Pesticides initiative. Washington, DC: NEETF, U.S. EPA, U.S. Dept. of Agriculture, U.S. Dept. of Health and Human Services, U.S. Dept. of Labor; March 2002. Available at: <http://www.neetf.org/Health/providers/implplan.htm>.

² Pope AM, Snyder MA, Mood LH, eds, for Committee on Enhancing Environmental Health Content in Practice, Institute of Medicine. 1995. Nursing, Health, and the Environment: Strengthening the Relationship to Improve the Public's Health. Washington, DC: National Academy Press.

³ Pope AM, Rall DP, eds, for Committee on Curriculum Development in Environmental Medicine, Institute of Medicine. 1995. *Environmental Medicine: Integrating a Missing Element into Medical Education*. Washington, DC: National Academy Press.

⁴ IOM (Institute of Medicine). 1991. *Addressing the Physician Shortage in Occupational and Environmental Medicine*. Washington, DC: National Academy Press.

⁵ Pope AM, Snyder MA, Mood LH, eds. *Nursing, Health & the Environment, Institute of Medicine Report*. Washington, DC: National Academy Press; 1995.

⁶ WHO. *Fact sheet 170*. Geneva, Switzerland: WHO, 1997.

⁷ Donaldson D, Kiely T, Grube A. 1998-1999 Pesticide Market Estimates. Washington, DC: US EPA, Office of Pesticide Programs, 2002.

⁸ U.S. Environmental Protection Agency. *America's Children and the Environment: Measures of Contaminants, Body Burdens, and Illnesses*. 2nd edition. February 2003. Publication EPA 240-R-03-001.

⁹ Mannino DM, Akinbami LJ, Moorman JE, Gwynn C, Redd SC. Surveillance for Asthma --- United States, 1980—1999. Division of Environmental Hazards and Health Effects, National Center for Environmental Health, Centers for Disease Control. *MMWR. Surveillance Summaries*. March 29, 2002/51 (SS01);1-13. Available at:

<http://www.cdc.gov/mmwr/preview/mmwrhtml/ss5101a1.htm>. Accessed November 11, 2003.

¹⁰ Landrigan PJ, Schechter CB, Lipton JM, Fahs MC, Schwartz J. Environmental Pollutants and Disease in American Children: Estimates of Morbidity, Mortality, and Costs for Lead Poisoning, Asthma, Cancer, and Developmental Disabilities. *Environmental Health Perspectives*. 2002; 110(7):721-728.

¹¹ U.S. Department of Health and Human Services. *Healthy People 2010*. 2nd ed. With Understanding and Improving Health and Objectives for Improving Health. 2 vols. Washington, DC: U.S. Government Printing Office, November 2000.

¹² Pope AM, Rall DP, eds. *Environmental Medicine: Integrating a Missing Element into Medical Education, Institute of Medicine Report*. Washington, DC: National Academy Press; 1995.

¹³ American Medical Association. H-135.973 Stewardship of the Environment. CSA Rep. G, I-89; Amended: CLRPD Rep. D, I-92; Amended: CSA Rep. 8, A-03.

¹⁴ American Medical Association. Report 4 of the council on scientific affairs, educational and informational strategies for reducing pesticide risks (resolutions 403 and 404). 1994.

¹⁵ Committee on Environmental Health. Ambient Air Pollution: Respiratory Hazards to Children. *Pediatrics*. Jun 1993; 91(6):1210-1213.

¹⁶ American Academy of Pediatrics Committee on Environmental Health. *Pediatric Environmental Health*. 2nd ed. Etzel RA, Ed. Elk Grove Village, IL: American Academy of Pediatrics; 2003.

¹⁷ American College of Preventive Medicine. Letter to Senate VA/HUD Subcommittee urging for increased appropriations for ATSDR for FY2004. 2003-045 (H). July 21, 2003. Available at: <http://www.acpm.org/2003045H.htm>. Accessed November 5, 2003.

¹⁸ Etzel RA, Crain EF, Gitterman BA, Oberg C, Scheidt P, Landrigan PJ. Pediatric Environmental Health Competencies for Specialists. *Ambulatory Pediatrics*. Jan-Feb 2003;3(1):60-63.

¹⁹ U.S. Department of Health and Human Services, Health Resources and Services Administration, Bureau of Health Professions, Division of Nursing. *Nurse Practitioner Primary Care Competencies in Specialty Areas: Adult, Family, Gerontological, Pediatric, and Women's Health*. April 2002.

- ²⁰ American Nurses Association. American Nurses Association Adopts Precautionary Principle. October 2003.
- ²¹ Schenk M, Popp SM, Neale AV, Demers RY. Environmental Medicine Content in Medical School Curricula. *Academic Medicine*. 1996 May;71(5):499-501.
- ²² Liebman A, Harper S. Environmental Health Perceptions Among Clinicians and Administrators Caring for Migrants. *MCN Streamline: the migrant health news source*. Volume 7, Issue 2. May/June 2001.
- ²³ McCurdy L, Roberts J, Rogers B, Love R, Etzel R, Paulson J, Witherspoon N, Dearth A. Incorporating Environmental Health Into Pediatric Medical and Nursing Education. *Environmental Health Perspectives*. 2004 Dec;112(17): 1755-60.
- ²⁴ Balbus JM, Umeh CE, McCurdy LE. Educational needs assessment for pediatric health care providers on pesticide toxicity. *Journal of Agromedicine*. 2005;11(1). In press.
- ²⁵ Roberts JR and Gitterman BA. Pediatric Environmental Health Education: A Survey of US Pediatric Residency Programs. *Ambulatory Pediatrics*. Jan-Feb 2003;3(1):57-59.
- ²⁶ Bellack JP, Musham C, Hainer A, Graber DR, Holmes D. Environmental Health Competencies: A Survey of Nurse Practitioner Programs. *American Association of Occupational Health Nurses Journal*. 1997 Jan;45(1):6.
- ²⁷ Graber DR, Musham C, Bellack JP, Holmes D. Environmental Health in Medical School Curricula: Views of Academic Deans. *Journal of Occupational Environmental Medicine*. 1995 Jul;37(7):801-11.
- ²⁸ Musham C, Bellack JP, Graber DR, Holmes D. Environmental Health Training: A Survey of Family Practice Residency Program Directors. *Family Medicine*. 1996 Jan;28(1):29-32.
- ²⁹ Clark NM, Gong M, Schork MA, Kaciroti N, Evans D, Roloff D, Hurwitz M, Maiman LA, Mellins RB. Long-term Effects of Asthma Education for Physicians on Patient Satisfaction and use of Health Services. *European Respiratory Journal*. 2000;16(1):15-21.
- ³⁰ Children's Environmental Health Faculty Champions Initiative: A Successful Model for Integrating Rogers, B, McCurdy, LE, Slavin, K, Grubb, K, Roberts, JR. Children's Environmental Health Faculty Champions Initiative: A successful model for integrating environmental health into pediatric health care. *Environmental Health Perspectives*. 2009;117(5):850-855
- ³¹ The National Environmental Education & Training Foundation (NEETF). *National Forum Proceedings: National Strategies for Health Care Providers: Pesticides Initiative*. Washington, DC: NEETF; December 2003.
- ³² Rogers B. 2003. Environmental health hazards and health care professional education. *AAOHN J* 52(4): 154-155; Available at <http://www.neefusa.org/pdf/PositionStatement.pdf>.

** The National Environmental Education Foundation was previously known as the National Environmental Education & Training Foundation.