Public Health Pipeline: The Future Generation of Public Health Professionals
An RWJF national program

SUMMARY
The Public Health Pipeline Program supported efforts by two education organizations from 1998 to 2003 to build the capacity of educational systems to improve science education for students in grades six through nine.

It was authorized by the Robert Wood Johnson Foundation's (RWJF) Board of Trustees in October 1997 for $2 million.

Key Results
Two organizations were involved in the program:

- The Association for Supervision and Curriculum Development (ASCD) in Alexandria, Va., initiated public health education projects in 10 middle and high schools across the country.
  - The 10 middle and high school education projects involved a total of about 2,190 students in a range of educational activities aimed at increasing understanding of the public health field. For example:
    - Students in Pawtucket, R.I., created a video and other educational tools that address the danger of lead poisoning.
  - ASCD published and distributed a book—Education and Public Health: Natural Partners in Learning for Life—describing the 10 projects and the lessons learned from the schools' experiences.

- The National Science Resources Center (NSRC)—jointly operated by the National Academies and the Smithsonian Institution developed a basic science curriculum for middle school students, conducting 100 teacher workshops, and working with leadership teams representing 750 school districts to reform their K–8 science education programs.
These districts represent 20 percent of the K–8 student population in the United States.

— The NSRC's activities built the capacity of elementary and middle school teachers and their school districts to increase students' scientific literacy that would include an increased awareness of the role of public health in their lives as well as their career options.

— The NSRC created and disseminated research-based science courses that addressed health topics and worked with hundreds of school districts to build the capacity of the educational system to support the implementation of a quality science curriculum in all science areas.

— Of the eight courses developed, the NSRC published and disseminated two new life science courses for middle school students.

  • One, entitled Human Body Systems, focused on human physiology and health, and included a website with extensive information on public health topics and careers.

  • The other, Organisms: Macro to Micro, dealt with the developmental stages of organisms.

  • Each unit included separate guidebooks for students and teachers.

— These course materials provided students with the opportunity to develop a conceptual understanding of important science concepts as well as critical-thinking and problem-solving skills needed to make informed decisions based on evidence.

  This combination of knowledge and skills is essential to both students and adults when facing decisions regarding health and health-related careers.

— As of March 2005, NSRC had sold over 6,353 sets of the two new units. Based on a typical class size of 26, the sales figures indicate that more than 165,000 students use the materials annually.

— Through this project, the NSRC also developed a network of 59 organizations dedicated to improving science education and partnered with these groups to put on conferences and other outreach events across the country.

— As a result of these efforts, the NSRC has engaged over 6,000 leaders and worked with 750 school districts representing 20 percent of the K–8 student population in the United States. Of these 750 districts, approximately 56 percent represent underserved populations.

  • Although RWJF had hoped the two organizations could collaborate, ASCD and NSRC worked separately with little interaction because their missions were
incompatible and their constituencies were different. (See The Program for greater detail).

**Funding**

The funding that RWJF provided NSRC through a grant to the Smithsonian helped match $10 million in grants given to the organization by the National Science Foundation for both curriculum development ($3.9 million) and a project to reform science education throughout the United States ($6.1 million).

Eleven other organizations provided a total of $4.2 million in additional matching funds. See Appendix 1 for a list of other funders.

**THE PROBLEM**

Studies have warned of a severe shortage of skilled public health professionals in the United States, but attempts to increase and improve the public health workforce have remained few and small in scope. Existing workforce shortages stem in part from the public's limited understanding of public health. Many people associate public health with low-paying jobs—primarily in government agencies focused on the underserved—and limited opportunity.

With little awareness of public health as a discipline, teachers, career counselors and parents frequently do not promote the field as an attractive career option. However, the health care marketplace is increasingly recognizing the importance of population-focused interventions in containing medical costs and enhancing the public's health. Today, half of the nation's public health graduates work in the private and nonprofit sectors in a variety of activities, from health education to administration.

To effectively address this issue, the nation must improve science education programs for all students. As the number of students participating in effective K–12 programs increases, so does the pipeline of scientists and engineers—including public health professionals. For those who are working to improve the quality of science education in kindergarten through grade 12, the middle school years are an especially critical period. As children enter adolescence, their interest in science often declines when the subject is taught in traditional ways.

Traditional approaches to science are particularly ineffective with young women and students whose primary language is not English, according to Kahle (1989) and Rosser (1993). In addition, NSRC Executive Director Sally Goetz Shuler, believes that health courses per se do not adequately prepare students or increase their interest in medicine and public health.
CONTEXT

RWJF's mission is to improve the health and health care of all Americans. Initiatives to strengthen the health care workforce, including physicians, nurses and other professionals, have been a major focus since RWJF's beginning as a national philanthropy in 1972.

Concerned about the capacity of the public health system to respond to emerging challenges, including the threat of declining federal funding, RWJF joined with the W.K. Kellogg Foundation in 1997 to launch *Turning Point: Collaborating for a New Century in Public Health*. The program, which is based at the University of Washington School of Public Health and Community Medicine in Seattle, seeks to strengthen the public health system by encouraging greater collaboration between public health agencies and other sectors. For more information, see the [website](#).

Along with this effort to modernize the organization and delivery of public health services, the RWJF staff saw the need to spur development of a sufficient, competent public health workforce. As a component of the foundation's workforce strategy, the Board of Trustees in October 1997 authorized a $2-million, six-year program named *Public Health Pipeline: The Future Generation of Public Health Professionals*.

The goal of the program was to build the capacity of educational systems to improve science education for students in grades six through nine in three ways:

1. Disseminate information regarding research and best practices in science education.
2. Develop comprehensive science curricula that were based on the National Science Education Standards and that addressed the learning needs of middle school students. The courses were designed to build children's conceptual knowledge in the earth, life, and physical sciences.
3. Design educational activities for middle and high school students that would interest them in the field of public health.

THE PROGRAM

Program Design

As envisioned by RWJF staff and presented to its trustees, *Public Health Pipeline* was to consist of two interrelated components:

- **Creating education/public health partnerships.** The Association for Supervision and Curriculum Development (ASCD) was to introduce middle and high school educators to the public health discipline and build bridges between education and public health. ASCD, located in Alexandria, Va., is a nonprofit, nonpartisan organization that represents 170,000 educators worldwide. Founded in 1943, it
provides professional development and other resources aimed at promoting excellence in education. With established credibility in the education field, ASCD was in a good position to help move public health into the classroom, RWJF staff believed.

As its part of Public Health Pipeline, ASCD was to engage local schools and community-based public health organizations in model partnerships that would initiate public health education relevant to students. After creating these model partnerships, ASCD would take steps to encourage their replication. In addition, RWJF staff expected ASCD to facilitate use of a basic science curriculum to be developed by the program's second component.

- Developing a basic science curriculum. The National Science Resources Center (NSRC) was to create science curricula for middle school science and to support their use in school districts across the country. The NSRC is a joint operation of the Smithsonian Institution, the large museum complex based in Washington, and the National Academies, a private, nonprofit organization in Washington that provides independent advice to the nation on matters of science, technology and medicine. NSRC disseminates information about exemplary science programs, develops curriculum materials and offers leadership development and technical assistance to help school districts reform their science programs.

In addition to developing basic science instructional materials, RWJF staff expected the NSRC to sponsor special sessions that would demonstrate the relationships of an effective science program to public health careers—such as workshops on the use of the curriculum and assistance to school districts in development plans for their implementation in their communities.

RWJF staff anticipated that the staffs of the two grantee organizations would collaborate as they pursued their different but related objectives. However, this collaboration was not spelled out to either organization until after the program was approved and the grants were made.

Frequently, RWJF creates a separate office to oversee the selection and work of national program grantees. In this instance—with only two grantees—RWJF staff administered the program directly. RWJF program staff members viewed the program as a first step to strengthening basic science education and interest in public health—a step that could eventually lead to a larger effort requiring an outside program office.

The Program

The program as implemented differed from the plan presented to the RWJF trustees in one key respect. The RWJF trustees were led to believe that the program was a collaborative initiative and that this collaboration had been agreed upon by ASCD and
NSRC, but the program officer had not communicated this to the two organizations prior to the program being approved.

The NSRC staff members state that they became aware of RWJF's intention to form a collaborative initiative between ASCD and the NSRC after receiving the grant in 1998. After learning of the collaboration, NSRC staff members organized several meetings with ASCD, one at their headquarters, to pursue ways in which the two organizations could work together. However, staff from both organizations determined that their organizational missions and program activities did not lend themselves to such collaboration. For example, ASCD does not disseminate information about curricula.

The lesson is that a written memorandum of understanding spelling out each participant's role is advisable when initiating a collaborative program, especially one involving two grantee organizations working together for the first time, says Susan Hassmiller, the senior program officer at RWJF who took over the program after Marilyn Aguirre-Molina, the original program officer who designed Public Health Pipeline, left RJWF.

**ASCD: Mini-Grants to Local Schools**

RWJF supported ASCD from September 1998 through October 2003 with a $1.2-million grant (ID# 033421). With the funding, ASCD created a mini-grant program to support the development of school-public health partnerships that would develop model projects that brought public health issues into the science curriculum. Competition for the grants was open to middle, junior and senior high schools that teamed with a health department or other community-based public health organization. With help from an external advisory committee, ASCD staff developed application guidelines for the mini-grant program—named the Health in Education Initiative—and in November 1998 issued a call for proposals. See Appendix 2 for the list of advisory committee members. See Appendix 3 for a description of the selection criteria and process.

From 185 applicants, the project staff and advisory committee selected 10 to receive $20,000 over two years. The 10 funded partnerships were in California, Kentucky, Massachusetts, Minnesota, New York, Pennsylvania, Rhode Island, Utah, Washington and West Virginia. Although private schools were eligible and some applied, none met the selection criteria, according to the project staff. Eight of the funded projects were new, and two were already in operation—purposely selected by ASCD to see if additional funding would spur their growth. In addition to geographic diversity, the winners spanned a broad spectrum of educational, economic, racial and cultural environments and focused on a variety of activities.

ASCD staff and the advisory committee convened two meetings with the local project directors to discuss public health issues generally and their projects specifically. ASCD staff also conducted seven site visits and helped some of the participating schools secure
additional funding from local sources. At the end of the two-year grant period, the ASCD staff surveyed the project directors about their perceptions of the value and impact of the projects. See Results for survey findings. Through a number of mechanisms, ASCD disseminated information about the projects. See Communications.

**NSRC: Basic Science Curriculum Development and Education Reform**

RWJF supported NSRC from May 1998 through April 2003 with a $775,000 grant (ID# 033422). NSRC used the funds to support two major, ongoing activities: creation and dissemination of a basic science curriculum for middle schools and an outreach program to help school districts institute quality science programs in the K–8 level.

The RWJF money helped match $10.0 million in grants that NSRC received from the National Science Foundation for development of a basic science curriculum and reform of basic science teaching. Eleven other organizations provided a total of $4.2 million in additional match funds. See Appendix 1 for the list of these 11 contributors.

**The Science and Technology for Middle Schools Program (STC/MS).** The NSRC developed eight research-based courses for grades six through nine in the life, earth and space, and physical sciences and technology. The STC/MS project builds on the NSRC’s Science and Technology for Children (STC) project, which developed a 24-module science curriculum for students in grades 1–6. Together, the two projects provide school districts with a comprehensive, standards-based science program for all students in grades 1–9.

Funding from RWJF supported the development of two life science units. In the life science units, the flow of concepts moves from the initial understandings about individual organisms that children develop in elementary school to a broader recognition of patterns in ecosystems and of the cellular basis of life. Students' observations of organisms as the organisms interact with their environment are used to develop an understanding of populations and ecosystems and of the diversity and adaptivity of organisms. Students' interest in the human body is used as the context for developing an understanding of structure and function, reproduction and heredity, and regulation and behavior.

- **Investigating Organisms.** Students investigate the growth and development of a diverse set of organisms representative of the five kingdoms. Students compare and contrast the developmental stages and life cycles of these organisms and identify how they are adapted to their environments. Concepts: structure and function, the cellular basis of life, reproduction, diversity and adaptation.

- **Investigating Human Body Systems.** Through experimentation and research, students explore the systems of the human body. Using student-generated data and models, they examine factors affecting the regulation of various physiological systems.
Concepts: cells, tissues and organ systems, health, nutrition, and disease, traits and heredity.

As with all NSRC products, the NSRC assembled a curriculum development team and advisory committee to research and develop the new courses, test them in the field with geographically and ethnically diverse populations and provide external evaluation of their effectiveness. The units were also prepared for commercial release, and information about the program was disseminated to school districts throughout the country. A website was specifically created to engage middle school students, highlight public health issues and provide resources about careers in health. After the courses were developed, the staff took steps to encourage their use, including conducting workshops in school districts around the country. See Appendix 5 for a more complete description of these development and dissemination activities.

Leadership and Assistance for Science Education Reform (LASER). In addition to creating and disseminating the new curriculum, staff of the NSRC's Leadership and Assistance for Science Education Reform (LASER) Center—formed partnerships with academic, nonprofit and business organizations and other entities around the country to promote the use of research-based science curriculum. NSRC and its LASER partners sponsored conferences, workshops and other events aimed at helping educators initiate and sustain improved science programs that meet the National Science Education Standards, which were developed by the National Research Council to improve science education. (The National Research Council is the principal operating agency of the National Academies).

Prior to the RWJF program, the NSRC had specifically targeted the involvement of academic health centers in its work. In 1997, the NSRC hosted a K–8 Science Education Leadership Institute at the National Academies' Institute of Medicine. Some 67 leaders representing 14 teams of school district-academic health center partnerships participated in this event. Teachers and administrators partnered with academic health center representatives to attend this week-long professional development experience designed to explore elements of effective science programs, develop a shared vision, and initiate and implement a strategic plan to improve science education. The NSRC tracked this group's involvement in the NSRC's LASER program and found that 11 of these individuals (16.4%) participated in one or more follow-up events between 1998 and 2003. The NSRC also found that of the 14 original teams attending the 1997 event (87.5%). Ten school districts and academic health centers sent new representatives to attend an NSRC LASER event during the grant period.

Since 1998, the NSRC has also engaged other academic health centers and organizations concerned with public health awareness. Representatives from the New Jersey Public Health Laboratories, the Partners in Healthcare System, the Providence Everett Medical
Center, and the National Center for Health Education have attended regional events designed to build awareness of effective science education programs.

**RESULTS**

**ASCD: Mini-Grants to Local Schools**

- Ten school/public health partnerships implemented projects that involved a total of some 2,190 students in hands-on learning about public health. The projects, in California, Kentucky, Massachusetts, Minnesota, New York, Pennsylvania, Rhode Island, Utah, Washington and West Virginia, spanned a wide variety of learning activities, from instruction in collecting and analyzing public health data to the creation of posters, videotapes and other communications tools to educate the public about public health problems and issues. The number of participating students also varied—from as few as seven in one school to several hundred in others. Four of the 10 projects continued after the grant period ended as part of the permanent curriculum. The 10 projects are described in full in Appendix 4 (click on titles to go to full descriptions). They were:

1. *Students Teaching Other Peers (STOP)*, Belmont, Calif. A middle school and its public health partners created a peer education program on drug use.

2. *A Community Health Leadership Proposal*, Green River, Ky. A one-semester course for high school juniors and seniors included both formal instruction and hands-on experience in public health.


4. *Community Health Awareness through Teens (CHAT)*, Grand Rapids, Minn. High school students researched five public health issues—fetal alcohol syndrome, tobacco use prevention, environmental health, violence prevention and child development—and spent 50 hours during the school year at an agency that addressed one of the five issues.

5. *College Exploratory Program in Public Health*, New York City. High school students met on Saturdays at Hunter College to learn about the public health field while improving their academic skills and college preparedness.


7. *Lead Smarts*, Pawtucket, R.I. High School students learned about lead poisoning and created communications tools to educate the community about the problem.
8. Planned Approach to Healthier Schools (PATHS): An Integrated School Curriculum, Logan, Utah. Junior high and high school students learned about the value of physical activity and good nutrition and developed public health intervention projects, including a health-oriented school newsletter.

9. Cross-Cultural Education in Public Health, Seattle. A nine-week curriculum gave immigrant students a basic understanding of public health methods, language and skills and tried to interest the students in public health careers.

10. West Virginia Public Health Pipeline, Harrisville, W.Va. Students explored biostatistics, epidemiology and other public health topics in an 18-week interdisciplinary course that included guest speakers, field trips and research projects.

- In response to an ASCD survey, all 10 local project directors reported that the project had an impact on the students, school and community. Several reported that students who participated in the curriculum decided to pursue health-related careers, and that both students and school staff had made behavioral changes to enhance their health. Project directors also noted increased awareness of the particular public health issue or issues addressed by the school's project.

**NSRC: Basic Science Curriculum Development and Education Reform**

- NSRC published two new basic science curriculum units, which are used by an estimated 165,000 students annually. The two units are part of NSRC's eight-unit series named Science and Technology Concepts for Middle Schools. Designed to be consistent with the National Science Education Standards, the series uses scientific inquiry and hands-on learning to help students build an understanding of important concepts in the life, earth and physical sciences and technology and learn critical thinking skills. See Appendix 6 for list of all eight units in the series. Sales data from the publisher, Carolina Biological Supply Company, indicate a strong interest in both courses. As of March 2005, the NSRC has sold 6,353 sets of the Human Body Systems and Organisms: From Macro to Micro. This information is based on first time sales and refurbishment kits. Based on a typical class size of 26 students, the use of these courses would conservatively impact 165,178 students annually. According to NSRC's executive director, Sally Goetz Shuler, the NSRC's science courses are helping to increase the pipeline of public health professionals by increasing the number of students interested in science and prepared for success in the sciences. The two new life science courses are:

  — Human Body Systems, published in the spring of 2000. This instruction kit includes a 206-page Student Guide and Source Book and a 315-page Teacher's Guide. The unit has 23 lessons on human physiology and health, covering the digestive, respiratory, circulatory and musculoskeletal systems. NSCD reported 5,500 sets sold.
— _Organisms: Macro to Micro_, published in the spring of 2003. This unit includes a 262-page _Student Guide and Source Book_ and a 415-page Teacher's Guide. Through the 20 lessons, students compare the structure, function and developmental stages of organisms.

- **NSRC's LASER team developed a network of 59 organizations dedicated to improving science education and partnered with these groups to put on conferences and other outreach events across the country.** The LASER partners included academic institutions, academic health centers, corporations, foundations, museums, professional societies, science education organizations and publishers of middle and elementary school curriculum materials supported by the National Science Foundation. See Appendix 7 for the list of 59 organizations. See Communications for details of the outreach effort.

**Communications**

**Association for Supervision and Curriculum Development**

ASCD published a 137-page book describing the 10 model partnership projects and identifying lessons that educators and public health officials can learn from the experiences. The organization mailed copies of the book—_Education and Public Health: Natural Partners in Learning for Life_ by Jenny Smith—to its 97,000 members in October 2003 and has since posted the full text on its website.

During the grant period, ASCD devoted a section of its website to information about the Health in Education Initiative. The section's focus has since changed but continues to carry some information on public health. The new focus of the section is another RWJF-funded project, Healthy School Report Card. See Afterward.

From 2000 to 2003, ASCD staff gave presentations on the Health in Education Initiative at each of the organization's annual conferences, which draw some 15,000 educators. Also, a project team presented information at the American Public Health Association's 2004 annual meeting. As a result of the RWJF project, ASCD conferences and publications increased their overall attention to school health issues, the organization reported.

**National Science Resources Center**

The NSRC staff held approximately 100 workshops to provide teachers and school administrators with information about the two new middle school science units. The NSRC website for students and other users of the curriculum provided information about the units as well as links to sites with information related to the individual lessons in the units. Between 2002 and the close of the grant, the site received more than 500,000 hits from 19,000 unique visitors, according to Smithsonian Institution data reported by NSRC.
In addition, NSRC during the period 1998-2004 worked with its LASER partner groups to conduct 52 conferences, workshops and other outreach events aimed at building a broader awareness of quality science teaching. Participants in the events learned about current research and best practices in science education and received technical assistance in developing and implementing five-year strategic plans for reforming science programs in their communities. The events reached some 6,000 individuals representing school districts, business, academia and museums in 800 communities, NSRC reported.

The NSRC project director made a presentation at ASCD's 2001 national conference on professional development programs for science teachers. See the Bibliography for details of a number of these communications activities.

LESSONS LEARNED

At the conclusion of the Health in Education Initiative, the ASCD program director, Theresa Lewallen, reported learning a number of lessons in the administration of grants to local schools. The lessons include the following:

1. **Require applicants to document how the proposed education project will be supported, sustained and evaluated.** The project director regrets she did not include these application requirements:
   - Evidence of administrative support in all partner organizations and a plan for how that support will be maintained.
   - Plans for maintaining appropriate project staffing levels and for achieving wide school and community buy-in to the project.
   - A description of how ongoing assessment and feedback will be used to make necessary changes as the grant project progresses.

2. **Convene all participants early in an effort with separate education projects to ensure a common understanding of goals and expectations and to build relationships.** Local project directors did not meet with ASCD staff and advisory committee members until about 10 months after the projects were selected. At that meeting, it became clear that some project directors did not understand the nature of public health education, expectations for the project and the technical assistance and resources available. Meeting earlier also would have allowed project directors to build mutually beneficial relationships.

3. **Site visits are an important tool for keeping community-based education projects on track.** Site visits originally were not part of the initiative, but their importance became clear as some of the funded partnerships encountered delays and problems. If she were starting over, the program director would visit the projects soon after they start and again in the second year. The visits would include meetings with administrators from the partner organizations, project staff and students.
4. **Education partnerships do better if they focus on one public health issue rather than several.** A single focus in Rhode Island (lead paint) and Utah (obesity/nutrition) facilitated integration of the public health issue across the curriculum and helped students to develop interventions that made a difference in their communities.

5. **Find strong "champions" to run an education project.** Projects were more successful when there were individuals in the school system and public health agency committed to the project and its successful completion.

The NSRC executive director Shuler, cited these lessons in planning and implementing science education reform:

1. **Local leaders attempting to create and implement an education reform plan need technical assistance.** NSRC's conferences and workshops allowed participants to see quality science teaching in action and observe how school districts develop reform plans.

2. **Organizations encouraging strategic education reform should resist making accommodations that threaten the integrity of the reform process.** The needs of school districts vary greatly across the country, requiring some modification in reform planning. However, research and external evaluations are the basis for NSRC's reform approach, and the organization was careful not to let communities stray too far.

3. **When corporations take a lead role in an effort to reform education, the process is apt to be more efficient.** The corporate culture helps instill meetings with a clear purpose and identify necessary follow-up actions.

4. **Winning the support of community leaders for education reform requires diverse, personalized marketing strategies.** Decision-makers tend to be cautious and to need encouragement, one-on-one invitations, evidence of success and sufficient time to commit resources.

5. **Leaders of reform efforts need opportunities to share successes and failures with each other.** NSRC sought to provide individuals interested in reform with opportunities for networking.

**AFTERWARD**

*Public Health Pipeline* helped inform RWJF's development of *Young Epidemiology Scholars®,* an $8.5-million national program launched in December 2001 to encourage high school juniors and seniors to learn about epidemiology, the basic science of public health. The program, which is administered by the College Board, conducts a competition for high school students in developing research projects that apply principles of epidemiology to a health-related area. Winners receive scholarships of up to $50,000. The program also sponsors a competition for teachers in creating innovative curriculum that introduces high school students to the skills of epidemiology.
Separately, in April 2003, ASCD received a 21-month RWJF grant of $290,463 (see Program Results on ID# 044793) to study the feasibility of developing a Healthy School Report Card—a mechanism to measure school environmental factors that can improve student health, behavior and academic achievement. RWJF staff viewed the project as building on the momentum and partnerships achieved by ASCD's Health in Education Initiative.

The report card is designed, first, to provide schools and their communities with tangible criteria for assessing factors linked to student health status and behavioral barriers to academic achievement; and then to help schools and their communities make programmatic decisions that support the health and well-being of all students and staff. It can be purchased at the ASCD online store.

Since 2003, the NSRC has continued to build upon the investment of the Robert Wood Johnson Foundation and others in the development of curriculum, professional development to teachers and outreach to schools. The NSRC also has launched several new products and services to assist students and teachers. Through its Professional Development Center, the NSRC continues to support teachers in enhancing both their knowledge of key science concepts and the pedagogy involved in using research-based materials. The NSRC is working on an enhanced version of the STC/MS website that will incorporate literacy strategies, online assessments for student and teachers and the use of handheld devices and other technology to learn science. In addition, the NSRC continues to educate and engage hundreds of academic leaders, scientists, educators and business people in the systems necessary to cultivate a scientifically literate workforce for the future.

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APPENDIX 1

Additional Supporters of the National Science Resources Center Efforts to Develop Science Curriculum and Reform Science Education

(Current as of the time of the grant; provided by the grantee organization; not verified by RWJF.)

In addition to RWJF, these 11 organizations provided support to help match $10.1 million in grants from the National Science Foundation:

- Bayer Foundation, $30,000
- Bristol-Myers Squibb Foundation, $900,000
- Carolina Biological Supply Company, $725,000 (including in-kind contributions)
- Delta Education, $375,000
- Dow Chemical Company Foundation, $400,000
- DuPont, $453,000
- Hewlett-Packard Company, $440,000
- Lucent Technologies Foundation, $665,000
- Merck Institute for Science Education, $125,000
- Shell Oil Company Foundation, $100,000
- Smithsonian Institution Educational Outreach Fund, $15,000

The Smithsonian Institution and the National Academy of Sciences also supported the projects with in-kind contributions of about $900,000 and $85,000 per year, respectively.
APPENDIX 2

Advisory Committee for Association for Supervision and Curriculum Development Public Health Pipeline Project

(Current as of the time of the grant; provided by the grantee organization; not verified by RWJF.)

Charles Deutsch, Director
Partnership for Children's Health
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Deborah Haber
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Gerald Lewis
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William T. Small
Former Associate Dean and Senior Advisor
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University of North Carolina
Chapel Hill, N.C.

Jane Ann Tustin
Coordinator, Health Services
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Lubbock, Texas

APPENDIX 3

Description of the Mini-Grant Application Criteria and Selection Process for the Health in Education Initiative

(Current as of the time of the grant; provided by the grantee organization; not verified by RWJF.)

The grant selection criteria gave preference to proposed projects that would:

- Implement innovative programs that involved students in addressing public health issues affecting their communities.
- Increase students' understanding of the methods, language, skills and careers within the field of public health.
- Ensure a meaningful integration of public health with other curricula.
- Include a strong experiential learning component.
- Provide replicable models with potential for wider implementation.

About 240 school-public health partnerships submitted letters of intent to apply for funding, and 185 submitted formal proposals. In January 2000, project staff selected 28 proposals for review by the advisory committee. In March 2000, advisory committee members selected 10 partnerships to receive $20,000 each year for two years.
APPENDIX 4

Descriptions of the 10 Model Partnerships Projects That Received Mini-Grants from the Association for Supervision and Curriculum Development

(Current as of the time of the grant; provided by the grantee organization; not verified by RWJF.)

The following summaries of the Health in Education Initiative projects are based on project reports to ASCD and other program documents, including Education and Public Health: Natural Partners in Learning for Life by Jenny Smith:

**Students Teaching Other Peers (STOP) (Belmont, Calif.)**
Partners: Ralston Middle School, San Mateo County Public Health Education Program and Department of Health Education at San Francisco State University

Drug use among youth was a concern in the Belmont-Redwood Shores School District, which includes Ralston Middle School. The school, with its community partners, created a three-tiered peer education program on drug use called *Students Teaching Other Peers (STOP)*. First, staff at the county department of health services trained university health education majors in community public health issues, careers in public health and peer education. The university students then went to the middle school weekly to mentor, train and coach eighth-graders, who in turn taught 10 health education lessons to third-graders at local elementary schools.

To prepare for their classes for elementary students, the middle school students engaged in a curriculum that included education on drugs, training in peer education, "shadowing" a public health worker (including epidemiologists, nutritionists, public health educators and environmental health specialists), and presentations on what they had learned to peers in health education classes. They also participated in activities for San Mateo County Public Health Week. In the second year, the peer education program expanded from two to five third-grade classes.

**A Community Health Leadership Proposal (Green River, Ky.)**
Partners: McLean County High School, McLean County Youth Services Center and Green River District Health Department

The high school offered 11th- and 12th-graders a one-semester course with formal instruction and hands-on public health experience. After learning about basic public health concepts and health careers, students researched statistics on health concerns in the community and designed a health education project aimed at a specific target group. These projects included: "Alcohol, Can You Handle It?" presented to 146 sixth- and
seventh-graders, "You Are What You Eat" for 50 third-graders and "Hand Washing is Cool" for 75 children ages three to six.

Twenty-six students participated in the first year, 31 in the second. The students completed some 255 hours of community service and presented health education to more than 500 people in the community. Six students presented information on their community education projects at national conferences of the Centers for Disease Control and Prevention and the Association of Supervision and Curriculum Development. Two students presented at the state meeting of Family, Career and Community Leaders of America, a national vocational organization for high school students in family and consumer sciences education. Some 25 percent of participating students reported that they had chosen health-related careers.

**Future Shock: Practicum in Public Health Research Skills for Health Activism (Cambridge, Mass.)**

Partners: Cambridge Public Schools, Cambridge Department of Public Health and Institute for Community Health (formerly Health of the City)

*Future Shock* is a public health curriculum in which students undertake research projects focused on community public health issues of interest to adolescents. With help from faculty at the Harvard School of Public Health, the Cambridge Rindge and Latin School, a public high school, initiated Future Shock three years before the ASCD grant program. However, funding and staffing difficulties had left the course's future in doubt. Discontinuing the course "would have been a serious loss to the academic life of the school," the project team reported. With the mini-grant from ASCD, the school was able not only to maintain *Future Shock* but expand it from one semester to two. The school continued the curriculum after the end of the grant period.

Students studied historic public health challenges like cholera, polio and toxin-produced cancer and also conducted their own public health research projects on more immediate issues. The September 11, 2001, terrorist attacks were a major source of interest. One student project investigated the rate of hate crimes in the school following the attacks. Another researched post-9/11 depression among schoolmates.

The entire *Future Shock* class organized two schoolwide events in response to 9/11. At one, historian and author Howard Zinn shared his views of the event. At the other, a panel of police, fire and public health officials discussed community disaster response.

During the course—an elective for juniors and seniors—the local health department supplied class speakers, invited students to visit to learn about public health careers and loaned an expert to write case studies of local health issues as a means of helping students form their own research questions.
Some students presented their project results at meetings of the Healthy Children Task Force, a local advisory group that includes city public health officials, members of the city council, school officials and other policy-makers. It is not unusual for projects to focus on student drug use or sexual activity. "People's eyes are popping out of their heads" when the task force hears a presentation on one of those topics, Virginia Chomitz, senior scientist for the Institute for Community Health, says with a chuckle. Two students presented research projects on 9/11 issues at the ASCD annual international conference in March 2002.

Community Health Awareness through Teens (CHAT) (Grand Rapids, Minn.)
Partners: Grand Rapids High School and Itasca County Resource Center

Staff at the two partner organizations created Community Health Awareness through Teens (CHAT), a curriculum for the Public Health and Community Issues class offered at the high school. Public health staff served as mentors for some 55 to 60 students as they researched five public health issues identified by the local Community Health Plan: fetal alcohol syndrome, tobacco use prevention, environmental health, violence prevention and child and adolescent growth and development.

The program required students to spend a total of 50 hours during the school year at an agency that addressed one of these five issues. During the first quarter of the school year, students learned about the issues through guest speakers, class discussions, surveys and media interviews. They were then to choose a topic within the five areas to study further.

Students initially had difficulty focusing on a health intervention project with a meaningful connection to the community, according to the project organizers. That changed when a real-life controversy erupted over a coal-burning power plant. The class took on the issue, inviting guest speakers on all sides to make their case, including representatives of the local public health agency.

Once students understood the issue, they educated their peers, making presentations to some 30 classes at the high school. Students learned about developing and broadcasting health messages through the media and created a video about the impact of public health issues on everyday life.

College Exploratory Program in Public Health (New York, N.Y.)
Partners: William Howard Taft High School in the Bronx, Bronx Lebanon Hospital and the Urban Public Health Program at Hunter College

Students participating in the College Exploratory Program in Public Health met for 20 Saturdays on the campus of Hunter College to learn about the public health field while improving their academic skills and college preparedness. The students worked in teams
to develop public health interventions. Hunter College students helped with the program as mentors and evaluators.

During the first year, the student intervention projects focused on rodent control and the prevention of sexually transmitted disease. During the second year, the students worked with the National Cancer Institute's Cancer Information Service to develop a tobacco-use prevention campaign targeted at Latino adolescents in New York City. Some 35 students in grades 9 through 12 enrolled in the program, and 25 completed it.

**Healthy Me + Healthy You = Healthy Schools and Healthy Neighborhoods (Philadelphia, Pa.)**

Partners: Thurgood Marshall Elementary School and La Salle Neighborhood Nursing Center

*Healthy Me + Healthy You = Healthy Schools and Healthy Neighborhoods* targeted low-income, culturally and racially diverse children in grades seven and eight at Thurgood Marshall Elementary School, located in an inner city Philadelphia neighborhood. The program combined in-school, after-school and summer camp components. During the first project year, staff integrated public health topics and careers into the health curriculum, addressing the topics of nutrition, exercise, childhood lead poisoning, dental health and asthma. The summer camp, held at La Salle University, focused on environmental health. In the second year, science classes included the impact of the environment on health.

Middle school students developed a public health book they used to teach kindergarten and first-grade students. The students learned about community resources and compiled information in a reference for teachers, students, and parents. Middle school students also developed public service announcements for use on cable television.

**Lead Smarts (Pawtucket, R.I.)**

Partners: Pawtucket School District, Memorial Hospital, Rhode Island Department of Health and Rhode Island Youth Guidance Center

In this industrial city with a growing population of immigrants, some 16 percent of children entered kindergarten in 2003 with a history of lead poisoning. The Pawtucket School District and its partners created *Lead Smarts* as a lead poisoning curriculum that middle and high schools could integrate into various subjects and classes. The curriculum highlighted the public health professions involved in addressing the lead poisoning problem.

Under *Lead Smarts*, students at the two Pawtucket high schools studied lead poisoning issues in a wide variety of classes, including family and consumer science, child development, English as a Second Language (ESL), parenting for pregnant teens and
special education. At the middle school level, teachers used the *Lead Smarts* curriculum in five classes and for a final assignment had students design brochures in their native languages.

Several community organizations—including the Department of Health and the Childhood Lead Action Project—sent staff into classrooms and accepted students as interns. The education and training coordinator at the Rhode Island Housing Resources Commission, for example, taught an eight-hour class on lead-safe home repair. As a result, some 33 students eventually earned remodeler/renovator licenses, opening the door to job opportunities.

In the second year of the project, high school students helped educate others in the community about lead poisoning through service-learning projects. For example, students wrote a nutrition guide to help minimize the effects of lead in the body. They also created videos, a website, PowerPoint® presentations, a coloring book and a lesson plan on lead education for younger children. One group of ESL students designed lead awareness posters and pamphlets in six languages.

The Pawtucket Visitors Center showcased the projects, and the state legislature gave the student participants a citation for their work on lead poisoning prevention.

*Planned Approach to Healthier Schools (PATHS): An Integrated School Curriculum (Logan, Utah)*

**Partners:** Skyview High School, North Cache 8-9 Center School, Utah State University and Bear River Health Department

In response to increased obesity among youth in this rural community, teachers at a local junior high school and high school integrated instruction in physical activity and nutrition into the curriculum across the spectrum—from English to biology. The local health department provided additional funds to support educational activities related to tobacco.

Under this program, named *PATHS*, teachers team-taught a public health curriculum on a designated day each week with the assistance of interns from Utah State University's health education program. *PATHS* students learned the relationship of good health to physical activity and nutrition, collected data on physical activity and nutrition practices at their schools and planned public health intervention projects.

Students created and distributed a health-oriented newsletter for the student body and faculty, promoted "No TV Week" and wrote letters to magazine publishers urging cessation of tobacco and alcohol advertising.

An evaluation of the project’s impact found that high school girls became more active and developed a better attitude toward physical activity. Following the students’ lead, staff at both schools started their own wellness program. One of the school principals received a
Healthy School Hero Award at the National Healthy Schools Summit for his support of the project.

**Cross-Cultural Education in Public Health (Seattle, Wash.)**

Partners: Seattle Public Schools and Seattle and King County Public Health

This project focused on providing immigrant students with a basic understanding of public health methods, language and skills and tried to interest them in public health careers. Approximately 400 students at three middle and two high schools participated in the nine-week curriculum, which covered such topics as culture and public health, health promotion, infectious disease and jobs and careers in public health.

The curriculum was flexible enough that a variety of classes could use the material. For example, in a literature class, students identified specific health issues and wrote to health officials about their concerns. In a computer class, students linked to a cross-cultural health website hosted by the University of Washington's medical center. The site highlights different ethnic groups and their cultural beliefs, expectations and practices related to health care. Students contributed their own ideas for articles on the website.

An end-of-the-year event brought together a variety of community organizations to examine ways that they could work together to further the efforts begun by the project. An evaluation showed improvements in public health knowledge and an increase in the level of interest in pursuing careers in public health.

**West Virginia Public Health Pipeline (Harrisville, W.Va.)**

Partners: Ritchie County Schools, Ritchie County Primary Care Association and Department of Community Medicine at West Virginia University

The West Virginia Public Health Pipeline project introduced 11th- and 12th-graders to public health issues and careers through an 18-week interdisciplinary public health course. Students explored biostatistics, epidemiology, environmental health sciences, health sciences administration and social and behavioral sciences. Guest speakers from a variety of public health careers described required skills, educational requirements and salary ranges for their fields of work.

Students also went on field trips to learn about real-life public health issues, including visits to a local sewage treatment plant and a restaurant. Following each speaker and field trip, students did further research and presented reports to the class. Students also completed research projects on public health issues facing their rural community, including tobacco use, underage drinking, cancer and heart disease.


APPENDIX 5

Description of Curriculum Development and Dissemination Activities of 
the National Science Resources Center

(Current as of the time of the grant; provided by the grantee organization; not verified by RWJF.)

To create the new curriculum units for middle school students, NSRC:

- Assembled a team that included a curriculum developer, a program assistant, the 
  project director and an editorial staff.
- Developed lessons for trial teaching.
- Revised the unit materials and activities prior to field testing.
- Trained and supported field-test teachers.
- Set up a website to aid communication between curriculum developers and teachers 
  conducting the field test.
- Used feedback from the field-test teachers to prepare for commercial release of the 
  units.

To help schools implement the new science units, NSRC staff:

- Presented workshops in school districts around the country.
- Enhanced the website for student users of the curriculum.
- Created a professional development center to provide products and services to help 
  teachers and schools use the materials.

APPENDIX 6

Titles of the Eight Units in the Science and Technology for Middle 
Schools Curriculum Series

(Current as of the time of the grant; provided by the grantee organization; not verified by RWJF.)

1. Properties of Matter
2. Human Body Systems
3. Catastrophic Events
4. Energy, Machines, and Motion
5. Light
6. Organisms – from Macro to Micro
7. Earth in Science
8. Electrical Energy and Circuit Design
APPENDIX 7

59 Organizations That Partnered with the National Science Resources Center to Reform Science Education

(Current as of the time of the grant; provided by the grantee organization; not verified by RWJF.)

Agilent Technologies
Alabama Space Grant Consortium
Alabama State Department of Education
ASSET Beaver County
AT&T
Bayer Corp.
BMW Manufacturing Corp.
Boeing
Bristol-Myers-Squibb Foundation, Inc.
California Institute of Technology
Capital Math Science Alliance
Carolina Biological Supply Co.
Carolina Power & Light
Clemson University
Delta Education
DuPont
E=MC2
East Bay Education Collaborative
Educational Services District 105, Yakima
Educational Services District 112, Vancouver
Eisenhower Consortium for Mathematics and Science @ SERVE
El Centro Elementary School District
EPI Center
Franklin Institute
Greenville County School District
Hewlett-Packard Co.
Immunex
Intel
Kendall-Hunt
Lab-Aids
Mercedes-Benz International
Merck Institute for Science Education
Michelin North America
Mon Valley Education Consortium
New Jersey Statewide Systemic Initiative
Oklahoma State University, Stillwater
Oklahoma Teacher Education Collaborative
Pacific Northwest National Lab/Batelle
Pacific Science Center
Pittsburgh Technology Council
Principals Academy of Western Pennsylvania at the University of Pittsburgh
Rhode Island College
Rhode Island State Department of Education
San Diego City Schools
San Diego County Office of Education
San Diego State University
Science Matters, Inc.
Science WISE
South Carolina State Department of Education
South Carolina Statewide Systemic Initiative
University of Alabama at Birmingham
University of Alabama in Huntsville
University of Rhode Island
University of Washington, Bothell
University of Washington, Seattle
U.S. Department of Energy
Washington Mutual Savings Bank
Washington State Office of the Superintendent of Public Instruction
BIBLIOGRAPHY

(Current as of date of the report; as provided by the grantee organization; not verified by RWJF; items not available from RWJF.)

Association for Supervision and Curriculum Development

Books


Articles


Reports


Survey Instruments


Grantee Websites

[http://health_in_education.ascd.org](http://health_in_education.ascd.org), a section of the website of the Association for Supervision and Curriculum Development that provided information about the
association's Health in Education Initiative during the initiative's funding period. (The website section remains active but now focuses on another RWJF-funded project, Healthy School Report Card.) Alexandria, VA: Association for Supervision and Curriculum Development.

www.simulconference.com/clients/ascd was developed in conjunction with the ASCD 2002 Annual Conference and was sponsored by the Health in Education Initiative. The virtual conference includes Web casts and audio casts of seven sessions, including the opening general session presentation by Dr. Jocelyn Elders, 2002.

**National Science Resources Center**

**Books**


**Audio-Visuals and Computer Software**


**Grantee Websites**

www.stcms.si.edu provides resources for users of the NSRC's middle school science curriculum series. Washington: National Science Resources Center.