

Public Service and Public Health: A University/Government Collaboration to Prevent Childhood Lead Poisoning

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Abstract

A multidisciplinary outreach project at the University of Connecticut is presented as a model of innovative collaboration addressing a serious public health problem—childhood lead poisoning. The project originated in the perceived needs of a coalition of community-based health care workers, educators, and public health officials for materials to teach young school-age children (grades 1–3) about the hazards of lead poisoning and about simple ways they can protect themselves. The coalition sought out the university, which had previously established a solid reputation for work in this environmental health area, to develop these materials. A partnership with the Hartford Health Department's Lead Poisoning Prevention Program provided not only financial support but also ongoing advice and assistance in implementing the program in the public schools. Finally, in developing both a children's activity book and supplementary adult materials, the authors designed outreach materials to reach three distinct audiences: children; teachers, administrators, and other youth leaders; and parents or guardians.

Childhood lead poisoning is a serious but entirely preventable environmental health problem throughout the United States. Lead can cause permanent damage—especially to the developing brains and nervous systems of fetuses and children under six years of age, who are most vulnerable to its effects. Even at low levels, lead is associated with decreased intelligence, behavioral problems, decreased growth, and impaired hearing. At moderate levels, lead can harm the kidneys and liver as well as the brain and nervous system. At very high levels, it can cause blindness, deafness, coma, and even death. According to the President's Task Force on Environmental Health Risks and Safety Risks to Children, nearly one million children in the United States are lead poisoned. Moreover, "lead poisoning remains one of the top childhood environmental health problems today. Without further action, over the coming decades large numbers of young children may be exposed to lead

in amounts that could impair their ability to learn and to reach their full potential” (2000, 2–3).

Old, deteriorating lead-based paint is the most common source of lead poisoning in children. According the U.S. Department of Housing and Urban Development, some thirty-eight million U.S. homes may contain potentially hazardous lead-based paint (*Alliance*

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to End Childhood Lead Poisoning 2000). Although lead poisoning affects children of all socioeconomic groups, it is particularly prevalent among poor inner-city children who lived in old, dilapidated housing (HUD 1995, 1-6). Children in these homes may eat lead

paint chips and eat or breathe lead paint dust. The tragedy of lead poisoning is that, with proper precautions, it can be prevented.

This article describes an outreach endeavor, involving several departments at the University of Connecticut and the Hartford Health Department, to educate children and adults about the dangers of lead poisoning and about simple ways they can protect themselves. The project serves as an example of the kind of “agile” multidisciplinary team that Simon (1999) discussed.

Building on Existing Strengths

The State of Connecticut has a large and active community of medical professionals, educators, public health officials, community activists, and others who are addressing the issue of childhood lead poisoning at many levels. The University of Connecticut, a land grant institution with a mandate for outreach and public service,¹ has through its Cooperative Extension System developed lead-poisoning prevention training manuals for state and local agency personnel, community educators, volunteers, and child-care providers (*Filchak et al.* 1995; *Mulroy, Filchak, and Gaudio* 1997). These manuals are supported by training programs run by the Cooperative Extension and are well-known and well-regarded in the state and indeed in the New England region. Extension educators have also developed specialized lead-poisoning prevention training programs for Native Americans in the region. In the past three years, more than 350 state

and local agency staff members, community educators, volunteers, community educators, child-care providers, and Native Americans have been trained in the hazards of lead and the ways to prevent lead poisoning, especially of young children. In short, the university has established a strong and reliable presence in this area of environmental health, making it a sought-after partner for new projects.

Working with Community-Assessed Needs

In 1999, the Connecticut Lead Hazard Awareness Coalition, a statewide interest group, approached the Cooperative Extension's environmental health educator with a request. Members of the coalition, which includes health care providers, health educators, public health and community development officials, and community action agency workers, believed that prevention efforts should be directed not just at adults but also at young children (grades 1–3), and they sought help in developing appropriate materials for this task. There were several reasons for targeting this age group: the children themselves, although no longer in the highest risk category, could still be seriously affected by lead poisoning (as can adults); and, in some impoverished urban settings, many of these youngsters may be partly or wholly responsible for the care of younger siblings, who do fall into the highest lead-poisoning risk category.

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The origin of this project in the perceived and enunciated needs of workers actively involved in preventing childhood lead poisoning must be emphasized. The project was not generated by ivory-tower academics or inspired by a request for proposals indicating the availability of grant money. The community had identified the need; funding became the next issue.

Establishing Community Partnerships

The high rate of poverty and the older, dilapidated housing in the city of Hartford are risk factors for lead poisoning. To address these issues, its health department runs an active lead-poisoning prevention program, which has sponsored numerous innovative educational and awareness programs.² The director of this program took a leading role in bringing this new children's project to fruition

by providing the necessary funding, with support from the U.S. Department of Housing and Urban Development and the State of Connecticut. In addition, he generously shared his technical expertise during the development stage. Later, he shepherded the finished products through the school system, earning the requisite approvals from the city's board of education and superintendent of schools to use the materials in the classroom. He also helped to train the health educators responsible for pilot-testing the classroom materials.

University Interdepartmental Cooperation

With the project foundation in place, the extension educator set about enlisting a team to accomplish the task. While the extension educator had substantial knowledge of lead poisoning and adult education, she recognized that the project would benefit from additional expertise available in other university departments. A human development specialist from the university's School of Family Studies was invited to provide advice on creating materials appropriate for young children. A staff writer/editor from the university's Environmental Research Institute was also asked to join the team. All three departments concurred that the task fell within the university's service mission.

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The combination of three areas of expertise proved synergistic, and roles were not narrowly construed during the project. For example, although the human

development specialist was considered the expert on age-appropriate activities, the other two authors brought to the project their own experiences as parents and teachers. The environmental health educator set out the basic lead-safety messages, but the other two authors felt free to suggest additions or deletions based on the research that they had done for the project. The writer put the stories on paper, but the other two authors sometimes proposed different wordings. Throughout the development process, continual give-and-take informed and generated new ideas and approaches.

Initial Parameters for the Outreach Materials

Although the materials evolved over time, some parameters were clear at the outset. Books would be developed for use in the

classroom, where adult guidance could be assured. In support of the Hartford school system's emphasis on reading, and at the suggestion of Hartford's director of health, the project designers decided that a literacy component must be an integral part of the materials. Considerable time was spent in determining the range of reading abilities of young elementary school children and in planning illustrations that would help beginning readers to grasp the public health content. Because of Hartford's large Hispanic population, all materials would be made available in Spanish as well as English.

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Collaboration in Action

The environmental health educator was primarily responsible for establishing the key messages: even young children can take some basic steps to protect themselves from lead poisoning—by identifying lead hazards, informing adults if hazards are noted, avoiding lead paint dust and lead paint flakes, washing their hands after they play and before they eat, leaving their shoes at the door, and eating healthy foods. The next step was to decide how to present these messages. The human development specialist visited public libraries and recorded the kinds of materials that children in this age group themselves selected to read for their own enjoyment. She found that many children liked the readings and activities found in high-quality children's magazines: stories, problem solving, word searches, board games, and drawing. The three authors decided to use the children's magazine model for their project. Employing a variety of activities would engage children with various learning styles, interests, and abilities. The messages of how to avoid lead poisoning could be repeated and reinforced in a variety of ways without boring the children.

Together the three authors developed the basic story line for the book. A multiethnic, multiracial group of four fictional children would learn how to recognize lead hazards and how to protect themselves from lead poisoning. The two boys and two girls would have guidance from a respected adult, their teacher. The goal was to

empower children to help themselves in appropriate ways but also to reinforce the need for adult help and supervision in dealing with lead hazards. On the basis of her knowledge of the target age group, the human development specialist suggested a detective theme and a club that children could join, and the writer, an avid mystery reader, created the Lead Busters Club, whose members include Agatha Krispy (do we really need to explain?), Sherman Holmes (as above), Henry Lee (a noted forensic pathologist and then Connecticut's commissioner of public safety), and Elisa Perez (named after mystery writer Ellis Peters), under the direction of their teacher, Ms. Marble (see above, Agatha Krispy).

Writing for the Audience

Once the initial outline was agreed upon, the writer developed the first draft: a story that explained where children would find lead hazards and what they should do to protect themselves. Then each child character was given the lead role in an activity to help the young readers bring the message back to their own lives, their own neighborhoods, and their own trusted adults. As noted above, literacy concerns were always at the forefront. For example, in the introductory story, the writer cued key words with small graphics, so that beginning or weak readers would be able to follow more easily by using the pictures. Vocabulary and sentence structure were carefully controlled for the young audience. The authors also recognized that the topic might raise fears in some children, so they included a segment to address potential worries and did not use the word *poison* in the text; instead, children were warned of lead *dangers*. The entire manuscript was developed over a period of months, with frequent feedback, revisions, discussions, and reviews on the part of all three authors and outside reviewers.

Designing for the Audience

Because the book was for young children, the authors knew from the first that it would be heavily illustrated, and they planned the text accordingly. In the initial manuscript, computer clip art was used to suggest the possible placement of graphics, but the team felt strongly that better illustrations, in the form of original art, were needed. Again, the university's resources were employed. The College of Agriculture's Office of Information and Technology contributed the efforts of two illustrators, one of whom also designed the finished book and supervised the print production process.

Collaboration at this stage was again critical, because the graphics had to grab and hold the attention of the children. The authors explained their major concerns to the illustrators. First, it was crucial to accurately and respectfully represent Hartford's racial and ethnic diversity, so that young readers could identify with the characters. Second, the authors wanted the figures to represent characters who would look contemporary but would not be quickly dated, for they envisioned a book that could be used for a number of years.

The illustrators then did their own research. It must be admitted that the University of Connecticut campus may not be the best place to observe current fashion trends, especially among the very young, so the illustrators had to look elsewhere for their models. They studied magazines and catalogs. They patiently drew, and redrew, and redrew, until the authors were satisfied.

Widening the Audience

While the illustrators were working on the graphic elements of the project, the authors developed a supplementary packet for teachers and parents. In this aspect of the project, the authors wanted to use the children's book as an outreach tool in a second way—as a conduit for presenting lead-poisoning information to adults in the community, including teachers, administrators, community leaders, and youth group leaders, all of whom could use the children's book in their classes or programs. In addition to suggesting how teachers might use the book in the classroom and offering some supplementary activities, therefore, the authors provided some background information on lead poisoning and some Web resources.

Finally, the authors designed materials that could reach a third audience: parents or guardians. The supplementary activities (cooking and singing) were designed so that children could take the papers home to their families. The authors included a letter to parents or guardians, again giving some background information and suggestions about where to get help with this topic. The packet also included a certificate of membership in the Lead Busters Club that children could post where the whole family could see it—the refrigerator being the most likely spot. The certificate repeated the lead-safety rules.

The last stage of the project before printing was a critical piece in making this outreach effort truly useful for Hartford, with its large Hispanic population. All of the materials were translated into Spanish.

Extending the Outreach

The books have now been printed and distributed to health educators in the Hartford public schools, where they have been well received. A quantitative assessment tool has already been developed, and the results will be tabulated over the next school year. The authors are busily engaged in finding resources to distribute their work beyond the pilot Hartford area.

One method of widespread distribution, and certainly one that will only become more important over time, is the Internet. The authors are therefore currently working to extend the reach of their outreach efforts by working with the National Institutes for Environmental Health Sciences, part of the National Institutes of Health, to create a Web site based on the Lead Busters Club, <http://www.niehs.nih.gov/kids/leadbusters/home.htm>.

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Notes

¹The university's strategic plan for the new millennium states: "The University will serve the state and its citizens in a manner that enhances the social and economic well-being of its communities. It will do so by providing leadership in the pursuit and dissemination of knowledge to all its constituents. . . . It will seek to enhance the quality of life and the economic well-being of Connecticut." (University of Connecticut, Strategic Planning Management Committee, *Strategic Plan for the University of Connecticut: Beyond 2000*, approved by the Strategic Planning Management Committee, January 17, 1995, approved by the Board of Trustees, February 10, 1995; <<http://www.uc2000.uconn.edu/strapl.html>>.) Moreover, like Michigan State (Simon 1999), the university clearly links outreach with scholarship: "Outreach is an active form of scholarship that cuts across teaching, research, and service. It involves generating, receiving, transmitting, applying, and preserving knowledge for the direct benefit of external audiences in ways that are consistent with university and unit missions." (*Report of the Strategic Planning Task Force on Outreach*, December 1999; <<http://www.uc2000.ucon.edu/outreach.htm>>.) The forms that faculty must complete for promotion, tenure, and reappointment consideration also include the category of public service.

² Recent examples include a citywide lead awareness poster contest for school children, a lead awareness message on milk cartons distributed throughout the greater Hartford area, and the production of a video featuring Hartford's own Mark Twain.

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About the Authors

The coauthors of this article developed *Adventures of the Lead Busters Club* (*Aventuras del Club de los Detectives del Plomo*), the curriculum described in the article. They also worked together on *What You Should Know about Lead Poisoning: A Resource Manual for Childcare Providers* (*Lo que debe saber acerca de la intoxicación por plomo*) (1997). Joan Bothell is the editor/writer for the Environmental Research Institute at the University of Connecticut. With Mary-Margaret Gaudio, she has also developed a lead-safe work practices training program and manual for painters, remodelers, and maintenance personnel. Maureen T. Mulroy is an associate professor in the School of Family Studies at the University of Connecticut. She also works as the human development specialist for the Cooperative Extension System, where she is involved in designing community-based educational programs for children, youth, and families. Mary-Margaret Gaudio is an extension educator with the Cooperative Extension System at the University of Connecticut. She develops and teaches public education programs in various areas of environmental health.