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Challenges to Superfund Community Nutrition Programs in Kentucky

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Abstract

Since 2000, the University of Kentucky's (UK's) Superfund Basic Research Program (SBRP) Community Outreach Core has provided support and guidance through Superfund Community Action through Nutrition (SCAN) programs, which meet the needs of individuals and communities affected by environmental contaminants. It has been shown that nutrition may modulate the toxicity of Superfund chemicals. SCAN programs integrate nutrition education, nutrition science research, and health communication to increase understanding of health risks associated with residing near Superfund sites. Two critical tasks must be accomplished. SCAN personnel must identify and recruit affected community members, and then, offer meaningful programs. Certain quantitative outcome measures and legal issues presented both challenges and opportunities. Community members preferred qualitative evaluation discussions, which showed increased knowledge and improved attitudes following SCAN programs. SCAN, in full partnership with affected communities, translates safe, effective nutrition information to reduce health risks associated with exposure to Superfund pollutants.

Keywords

nutrition; nutrition education; community outreach; Superfund

Introduction

Since 2000, the University of Kentucky's (UK's) Superfund Basic Research Program's (SBRP's) Community Outreach Core has provided support and guidance by providing critical information on nutrition and health-related issues to meet the needs of individuals and communities affected by environmental contaminants. This purpose is underscored through its title, Superfund Community Action through Nutrition (SCAN). SCAN is an integral part of the overall SBRP, offering the means for disseminating and implementing the findings and insights of the project's research component as well as other relevant scientific information to affected persons. The aim of SCAN is to empower affected individuals and communities to take proactive steps in regard to their own health by drawing on the strength and findings of the nutrition-related research of the overall program and on the nutritional and scientific expertise within UK's SBRP personnel.

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In coordination with UK's SBRP's overall hypothesis that nutrition can modulate the toxicity of Superfund pollutants and thus modulate health and disease outcomes associated with Superfund chemical insult, the Community Outreach Core interacts with communities through a series of nutrition education programs. SCAN programs are developed for three audiences, 1) affected Superfund communities including community action and interest groups, 2) broader public audiences, such as at a state fair, and 3) health care professionals such as physicians, pharmacists, and dietitians. Much of SCAN's work is primarily focused on communities and community groups located near two Superfund sites. This work has given SCAN personnel a new appreciation for the importance, not only of scientific research itself, but also of bringing that science to the people most affected. The experiences have been both rewarding and challenging, and this article will also focus on both of these aspects of SCAN programs.

SCAN Programs

Under the Community Outreach program, SCAN personnel begin by identifying and recruiting the individuals and community members affected by the specific Superfund site. Then, SCAN personnel must conduct a needs assessment of those individuals. In doing this, a key component of initial meetings of community members is to listen to community constituents as to their health-related needs and concerns. Then, in partnership with the community, health care professionals, government agencies, industry representatives, and basic science researchers, SCAN programs are designed to meet those perceived needs through appropriate translation and communication of scientific information.

SCAN programs are an integrated blend of community nutrition education, nutrition and scientific research, environmental and other health-focused issues, health communication, and service. The programs test the hypothesis that nutrition and environmental health education programs will improve knowledge, attitudes, and behavior related to reducing health risks associated with exposure to Superfund environmental contaminants. The SCAN programs are based on three premises.

First, it is clear that nutrition impacts individuals' overall health, particularly chronic conditions such as cardiovascular disease (CVD), type 2 diabetes, obesity, hypertension, and cancer (Thomas, 2004). These medical conditions diminish quality of life and impose significant economic costs. As an example, the state of Kentucky ranks higher in CVD, diabetes, cancer, poor dietary habits, and inactivity than the national averages for these conditions (Kentucky Department for Public Health and the Centers for Disease Control and Prevention, 2002, Kentucky Cancer Registry, 2006). Scientific evidence increasingly suggests that poor diet plays an important role in the onset and progression of these chronic diseases.

Second, Superfund pollutants contribute to an increased risk for certain chronic diseases including CVD, diabetes, hypertension, and cancer. It has been shown that PCBs and other chlorinated compounds may induce cancer, suppress immune function, alter nervous system performance, disrupt hormone function, produce reproductive abnormalities, decrease concentrations of antioxidants in the body, and promotes CVD and other chronic diseases (Hennig et al., 2004, Robertson and Hansen, 2001).

Third, it has been shown that nutrition education can be effective in increasing nutrition knowledge (Rosenbloom et al., 2004) and in improving diets and overall health (Bhargava and Hays, 2004). Nutrition intervention in the form of nutrition counseling and education reduced cholesterol levels (Gaetke et al., 2006, Sikand et al., 1998), lowered the risk of CVD (Sikand et al., 1998) and improved blood glucose control measures for type 2 diabetes (Gaetke et al., 2006, UK Prospective Diabetes Study 7, 1990).

Outcomes for SCAN Program Participants

SCAN programs are evaluated for effectiveness by defining inputs, outputs, outcomes and outcome measures using the Logic Model (Taylor-Powell et al., 2005). Program participants will demonstrate the following outcomes: 1) increased knowledge of issues involving environmental health, nutrition, environmental contaminants, and Superfund sites, 2) improved, positive, proactive attitude changes as to health issues from living in close proximity to or being affected by hazardous waste sites, and 3) improved nutrition and health-related behaviors, such as increased intake of foods high in anti-oxidants (fruits and vegetables) and low in fat (Hennig et al., 2004) and increased physical activity.

Various measures are used to assess the outcomes and impact of the SCAN programs. Pre- and post-test questionnaires are developed for topics specific to each SCAN program. More advanced SCAN programs have additional (optional) nutrition assessment techniques to measure effectiveness of various nutrition interventions and changes in nutrition (food purchases, food and nutrient intake, body mass index, and body composition) and health (exercise and smoking) behaviors. Results of the nutrition assessment measures provide feedback for individual participants as to the effects of behavior changes and for SCAN personnel as to the efficacy of the nutrition intervention education.

Quality Control for SCAN Programs

SCAN personnel include Registered Dietitians (RD), who are trained in the science of nutrition and diet therapy for chronic diseases, nationally certified by the American Dietetics Association, and licensed in Kentucky as the exclusive health care professionals licensed to educate and counsel people on nutrition and proper diet. Faculty in the University of Kentucky's Cooperative Extension Service (CES), whose mission is to provide educational programs about the knowledge and research generated by public universities to the citizens of the state, also participate in the program.

SCAN's Superfund Sites' Characteristics

Selection of Superfund sites for our SCAN programs involves important choices. Kentucky has over 500 Superfund sites, of which twenty have been on the National Priorities List. In choosing sites for our efforts, SCAN has used factors such as size of the site, the nature of the pollutants discharged at the site, and the geographic location of the site. Using these factors, we have focused SCAN programs at communities near two Superfund sites, one in western and one in eastern Kentucky.

Challenges Faced in the UK Community Outreach Core

Once a Superfund site has been determined, in order to be effective in achieving the goals for the SCAN programs, two critical tasks must be accomplished. First, the groups and individuals who have been affected by the contaminants must be identified and recruited. Second, meaningful programs must be offered that can be shown to be helpful to the affected groups and individuals.

Thus far in conducting SCAN programs, two challenges stand out in our efforts to accomplish both of these critical tasks. One is that the National Institute of Environmental Health Sciences (NIEHS) policies as to Community Outreach prohibit program personnel from utilizing invasive procedures to gather data on community participants. This limits the gathering of pre-program, post-program, and follow-up data through commonly accepted medical procedures such as blood samples. To many scientists, this is important data for research documentation. Similarly, the limitation restricts SCAN personnel from gathering important data that would

be useful in assessing the effectiveness of the SCAN programs themselves. The other, more significant, and probably least anticipated, challenge that SCAN has faced in accomplishing the two tasks necessary to our success, is the role that litigation plays in working with Superfund communities. As scientists, we were not expecting to confront so dramatically the ramifications of legal issues in working with a community education program. As with most challenges, however, they have also offered unexpected opportunities as we have worked to accomplish our two critical tasks.

Some background for those unfamiliar with the U.S. legal context surrounding our work may be helpful. The Superfund legislation was enacted in 1980 and attempted to address a range of issues arising from hazardous waste sites across the U.S., particularly in the chemical and petroleum industries (Superfund, 2006). The legislation provided for the prohibition and regulation of closed and abandoned hazardous waste sites, provided legal liability for those who allowed releases of hazardous wastes, and created a trust fund to pay for cleaning up waste sites when a responsible party could not be located.

These Superfund efforts have to be viewed as part of a broader environmental response by Congress in the 1970's and 1980's, when a range of federal legislation was passed regulating air and water pollution as well as requiring Environmental Impact Statements for governmental actions having significant environmental implications (Superfund, 2006). During this period at least, Congress was responsive to increasing demands from the public for the establishment of pollution control, a broad concern that remains a high priority even today in public opinion polls.

Importantly for our work in the UK Superfund program, at the same time of this increasing congressional legislative action, federal and state courts in the U.S. were increasingly called upon to decide cases brought by injured private parties seeking to establish liability and recover judicial remedies for environmental harm. These parties utilized common law actions such as negligence, nuisance, and trespass - cumulatively constituting an area of law that has come to be known as "toxic torts" - as the bases for their claims, and courts have increasingly utilized those theories to attach liability to those parties responsible for the release of contaminants like radioactive wastes and PCB's. People, who have suffered harm to their health, their life expectancies, their property, and the very quality of their lives, are typically and understandably interested in pursuing compensation for that harm from the parties who are responsible. Our judicial system is the appropriate forum for the airing of their claims and arguments and has been responsive in terms of awarding compensation to claimants who can establish liability. What this has meant for SCAN programs is that often the individuals we would most like to reach with our programs may be plaintiffs in pending litigation or considering becoming plaintiffs in litigation, thus adding to the challenges that we face in accomplishing our two critical tasks.

Identifying and Recruiting Affected Individuals and Groups

Even after selecting a Superfund site for SCAN programs, the identification and recruitment of individuals and community groups for our efforts can be difficult. In many cases, the affected individuals may not know themselves if they have been exposed to Superfund contaminants. Furthermore, the identity of the pollutants and the means by which they are released and move into the environment may not be known. For example, ground waters may flow in various directions, and air plumes may affect communities not in close proximity to a site.

SCAN has used several of the more commonly used procedures for working with a community and have had some success: placing information in local newspapers, organizing town meetings, and using personal contacts in the area, including local CES agents. Once the affected groups and individuals have been identified, we must accomplish recruiting and earning the

trust of these parties so that they will participate in SCAN programs. What makes this difficult is the fact that the people who have been affected by Superfund sites are often, legitimately, not inclined to trust offers of help from strangers, particularly from outside of their communities. We have listened to some describe how they have watched their own family members and friends suffer and die from health problems resulting from exposure to environmental pollutants, and their reluctance to respond is understandable. In addition, both Kentucky SCAN sites are in rural areas with the affected community members being individuals living near or working at the site. Often these individuals have limited educations and low incomes, and many of them needed the jobs provided by the Superfund industry in order to feed their families. While these same people often did not recognize the danger of the chemicals they were working with or were afraid to speak out for fear of losing their jobs, it was important to understand their economic needs and their sense of loyalty to their employers. These factors provide certain barriers to identifying and recruiting those we want to reach.

In our efforts at identifying and recruiting, we have found that NIEHS's non-invasive procedures became a benefit. At one of our early meetings with one community group, the members expressed concern about becoming "research subjects for a study." Thus it was helpful to assure these participants that no invasive procedures would be done and were, in fact, prohibited by NIEHS, turning the limitation into an opportunity for our programs.

It is here that the influence of litigation also has been felt, in a positive way. One of the most successful methods of identifying and recruiting affected groups and individuals for SCAN programs has been contact with certain attorneys. One is a Kentucky attorney who has dedicated his career to working with public interest environmental lawsuits. This attorney knew community members that were affected by releases from our particular sites and was willing to assist us in making contacts with these people. We also found that other attorneys practicing in the local community often knew individuals involved in litigation as potential victims of hazardous contaminants, or they knew the attorneys who had participated in related litigation. Almost all attorneys recognized the value of the service being provided by SCAN and encouraged their clients to come to our meetings. All of the attorneys we talked with expressed more than a legal obligation to their clients; they were also concerned about their welfare and future quality of life.

For our efforts to identify and recruit participants to SCAN programs, both the NIEHS limitation and the presence of pending litigation have offered us opportunities to be more successful.

Offering Meaningful Programs

Once we have identified the affected groups and individuals and have successfully recruited their participation, we must provide effective nutrition outreach programs. One important aspect of our programs, however, is that the content should reflect the needs and interests of the affected parties at each site rather than imposing on these parties our views of what they need to know. Thus, once trust is developed with community members, SCAN personnel encourage the participants to help in the design and implementation of the nutrition education programs. This takes time. At one site, it took approximately three years from initial contact to an actual SCAN presentation at a community group meeting. At the second site, it was about eight months until the first SCAN program was presented.

In response to the NIEHS limitation on the use of invasive procedures, we pursued other acceptable, non-invasive methods of gathering data on participants, such as dietary recalls and body composition calculations, which do not tend to discourage participation. As noted above, by causing us to use more sensitivity and care in seeking useful data, the NIEHS limitation may well work to our advantage in obtaining the participation and trust of affected community

members. On the other hand, it prevents us from obtaining valuable information relevant to our SCAN programs and the broader SBRP research efforts.

Similarly, the presence of pending and potential litigation presents the same challenge and may impose the same limitations on invasive procedures. One of the attorneys for some affected individuals explained that, while she supported meaningful ways to benefit her clients' health, she would not permit those clients to participate in tests that might be used against her clients' cases. Defense lawyers, for example, might raise questions of causation if plaintiffs were to experiment with dietary changes as part of a study. Attorneys for plaintiffs were helpful in encouraging their clients' participation, but they were alert to any ways that this participation could affect their clients' legal claims.

Given our policy of structuring SCAN programs to meet the needs of the local community members, most of our groups have preferred informal, educational meetings to the gathering of data from them. Needs assessment surveys have suggested such SCAN program topics as how foods affect us, ways to increase fruits and vegetables, and alternative sources of anti-oxidants such as spices. One group preferred qualitative feedback rather than formal documentation of even non-invasive methods such as food records or dietary recalls. As a result, our effectiveness must be measured by opinion responses (such as, of the 26 regularly attending participants, all agreed that they appreciated our interest in them, we did not talk down to them because they were from a rural area, and our ability to remember their first names).

At another site, an informal needs assessment survey identified such topics as cancer clusters and how they are determined, heavy metals in the environment, and PCB's and CVD. This specific group preferred a more advanced science approach to the content of the program. Again, however, qualitative evaluations from 35 individuals in attendance showed that 100% strongly agreed that they increased their knowledge of one or more science topics, and 67% strongly agreed that they were willing to change dietary behaviors as a result of the information presented.

Conclusion

Nutrition education programs are an important community service for Kentuckians in proximity to Superfund sites. SCAN programs involve two key steps: identifying and recruiting the groups and individuals who have been affected by environmental contaminants and providing meaningful programs that can be shown to be helpful to those affected. Several challenges have emerged in working with Superfund communities, including the NIEHS limitation on invasive procedures and the limitations imposed by the realities of pending litigation. These challenges also provided certain opportunities. Community members preferred qualitative evaluation discussions following SCAN programs, which showed increased knowledge and improved proactive attitude changes to nutrition and environmental health issues. SCAN in full partnership with affected communities is better able to translate safe, effective nutrition information to support the needs of Superfund communities.

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