

Promoting Environmental Health Policy Through Community Based Participatory Research: A Case Study from Harlem, New York

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ABSTRACT *Community-academic partnerships have demonstrated potential for studying and improving community and environmental health, but only recently have their policy impacts been systematically studied. This case study highlights the evolution, research, and policy processes and outcomes of a community based participatory research (CBPR) partnership that has had multilevel impacts on health policy concerning diesel bus emissions and related environmental justice issues. The partnership between West Harlem Environmental ACTION, Inc. (WE ACT) and the Columbia University Center for Children's Environmental Health was explored using a multimethod case study approach. The conversion of New York City's bus fleet to clean diesel and the installation by the EPA of permanent air monitors in Harlem and other "hot spots" were among the outcomes for which the partnership's research and policy work was given substantial credit. Lessons for other urban community-academic partnerships interested in using CBPR to promote healthy public policy are discussed.*

KEYWORDS *Community based participatory research, Community partnerships, Environmental justice.*

INTRODUCTION

Community based participatory research (CBPR) has increasingly been recognized as a community-driven and action-oriented approach to health research that is highly consistent with the mission and core values of public health. As defined by Green and his colleagues,¹ CBPR involves "systematic inquiry, with the participation of those affected by the issue being studied, for the purposes of education and taking action or effecting social change." A collaborative and colearning process that stresses systems development, community capacity building, and balancing research and action,² CBPR has achieved particular prominence in the US in the fields of urban health and environmental justice, and a growing body of literature

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exists in this area.^{3,4} To date, however, little attention has been focused on the impacts of CBPR on the policy level.⁵

This article helps address this gap in the literature by documenting the partnership between West Harlem Environmental ACTION, Inc. (WE ACT) and Columbia University's Center for Children's Environmental Health to study and address diesel bus pollution and related air quality issues in this low income community. The partnership's research and WE ACT's follow up public education and policy advocacy have been widely credited with helping to bring about environmental health policy changes on the municipal and state levels.^{4,6-8}

STUDY CONTEXT AND METHODS

The WE ACT partnership was one of 10 CBPR projects selected for inclusion in a W.K. Kellogg Foundation funded effort to study and document the impacts of CBPR on health promoting public policy. Two site visits were conducted in 2003 by members of the research team and included five semistructured, in-depth interviews with community and academic partners, a community focus group, and participant observation. The interviews, which averaged 60–90 min in length, included questions designed to explicate the formation and evolution of the partnership; the research methods, roles, and findings; policy goals and the policy steps and activities undertaken by the partners to help achieve these goals; barriers and success factors encountered; and perceived contributions of the partnership and its research to changes in programs, policies, and practices.

The focus group was conducted with seven youth members of WE ACT identified by organization staff as being involved with and knowledgeable about its current youth work. Focus group participants, who received \$50 gift cards for their participation, were asked 11 questions concerning the history and nature of their involvement with WE ACT, the success factors and obstacles experienced, and lessons learned. Subsequent documents review and phone interviews with two policy makers also were conducted to provide additional perspectives on the partnership's research and policy related work and its perceived outcomes.

Audiotapes of the interviews and focus groups were transcribed and independently coded by three research team members using a coding sheet developed by the research team and consisting of 15 major items and a number of subitems designed to capture key domains of interest (e.g., CBPR partnership formation, research methods, policy goals, contextual issues, and sustainability efforts). The qualitative software package, ATLAS.ti then was used to group all responses related to these 15 key domains by site, and reports were generated for each domain. A report on sustainability efforts, for example, consisted of all references to this topic in the interview and focus group transcripts highlighted by coders, together with surrounding text to provide context. Members of the research team then reviewed the reports for each domain and independently identified key themes and codes. Within the domain, "Lessons Learned/Advice to Others," for example, all three coders had identified the theme: importance and benefit of building a community base of support. The research team then compared and reconciled their findings using pattern recognition analysis.⁹ A three-page summary of the WE ACT partnership project and a longer (41 page) case report based on the findings were

developed and shared with partnership staff for member checking as an added means of helping to ensure the accuracy of data interpretation.

The particular WE ACT partnership study examined in this article (the “Earth Crew study”) was conducted a decade ago but frequently was described as the partnership’s signature CBPR effort. This paper therefore draws on in-depth interviews with community and academic partners who were involved with or knowledgeable about that study, policy maker interviews, and archival review rather than on the focus group and participant observation data as the latter related to more recent partnership efforts.

BACKGROUND

WE ACT was founded in 1988 as a nonprofit organization which used community-based action (and later CBPR) to advance environmental health policy, public health, and quality of life.¹⁰ The organization contributes to community capacity building through special activities such as its youth programs and environmental justice leadership training institutes, and also plays a pivotal role in building coalitions around environmental justice issues. With a few notable exceptions, however (e.g., the Earth Crew study described in this paper), the CBPR projects in which WE ACT has participated have involved principally WE ACT staff as the community partners, with other community members mobilized to participate in special follow up community events and advocacy-related activities.

WE ACT serves Northern Manhattan (comprised of East, West and Central Harlem and Washington Heights), a 7.4-square-mile area in which about 627,000 mostly low- to mid-income African-Americans and Latinos reside. Known for its richly diverse population and cultural history, the area also bears disproportionate rates of disability and premature death. Morbidity and mortality rates from asthma in Harlem are among the highest in the nation with one recent study finding that over one in four children in central Harlem suffer from this disease.¹¹

Contributing to this problem is the poor air quality that results from the diesel buses and related polluting facilities which are disproportionately located in the area. Six of the eight Manhattan diesel bus depots housing one third of the city’s bus fleet were sited in Northern Manhattan, and the Metropolitan Transit Authority currently is purchasing land for parking lots for additional buses.

Diesel engines emit 30–100 times more particles than gasoline engines that have emission control devices,¹² and research has demonstrated a significant association between high levels of diesel exhaust and elevated rates of respiratory ailments and asthma.^{13–15} These studies also have supported Harlem residents’ concerns about the deleterious effects of diesel buses, documenting that the largest contributor to area pollution is excessive bus idling in lots and in the streets around the depots. As a WE ACT press release put it, “The City-wide benefit of public transportation services is Northern Manhattan’s burden.”

The formal partnership between WE ACT and the Columbia Children’s Center for Environmental Health (CCCEH) began in the mid-1990’s with the goals of (1) studying the relationship between community-level environmental exposures and environmental health outcomes and (2) translating those findings into policy changes that create equity in environmental decision making and environmental protection. Of the several CBPR efforts it has undertaken, the WE ACT

partnership's "Earth Crew" study has been particularly useful from a policy perspective and is the focus of this article.

RESEARCH METHODS, ROLES, AND FINDINGS

In July 1996, 17 Earth Crew youth, under the supervision of epidemiologists from Columbia University, undertook a study to measure sidewalk concentrations of diesel exhaust particles in order to determine whether particular areas within Harlem were disproportionately impacted by higher diesel exhaust emissions. The topic for this study came from the community partner, while the study itself was largely designed by the academic partners. The Earth Crew youth, who were paid community interns aged 14–18, were trained to operate and calibrate backpack air monitors and to conduct traffic counts (using digital counters for counts of diesel buses, diesel trucks, cars, and pedestrians) on selected streets for five weekdays, 8 h per day.⁶ The four sites chosen for the study had been designated by the Environmental Protection Agency (EPA) as "hot spots" that had particularly heavy foot and vehicular traffic and were near bus depots. Largely in response to WE ACT's urging, the EPA agreed to conduct ambient monitoring in these same locations, providing an important source of comparative data.

Researchers from Columbia were assigned to each site, providing training, general study oversight, and mentoring for youth in the field. Air monitors measured particulate matter small enough to have potentially harmful health effects (PM_{2.5}) and elemental carbon (EC) concentrations, a key component of diesel exhaust particles.

Data were analyzed primarily by the researchers using two-way analysis of variance (ANOVA). Findings indicated that variations in PM_{2.5} and EC appeared to be related to the magnitude of local diesel sources and reinforced community concerns about the disproportionate burden of diesel traffic and bus depots in Harlem. Results also showed that PM_{2.5} concentrations ranged from 22 to 69 $\mu\text{g}/\text{m}^3$ in 8 h,⁶ compared to the annual fine particle standard (15.1 $\mu\text{g}/\text{m}^3$) proposed by the US Environmental Protection Agency (EPA). WE ACT's finding closely mirrored the EPA's own findings using ambient monitors, a fact which further increased the credibility of the Earth Crew study.

The genuine colearning involved in WE ACT's partnership research was frequently pointed out in our interviews. An academic researcher thus described how in one instance, input from community members caused him to rethink the placement of ambient monitors. Community members questioned the outside researchers' decision to place air monitors solely on school rooftops, suggesting that they instead be placed outside the windows where the children breathe. As this academic partner commented,

Sometimes as scientists we make assumptions and don't rethink assumptions to see how they fit in a natural situation. I think community people, because they are looking at it from a fresh perspective, will question the assumptions in a way that actually improves the science. It may tailor things to the situation in a way we would not have thought of.

In sum, the participation of community partners in identifying research questions and offering advice on study design and the extensive involvement of WE ACT Earth Crew youth in implementing the study appeared to contribute substantially to the research component of this CBPR project.

FROM RESEARCH TO POLICY ACTION

A hallmark of CBPR involves its commitment to combining research with action to effect change,²⁻⁵ and for WE ACT, policy level change has been a particularly important avenue for working to improve urban environmental health. Although differences in time table and sense of urgency between the partners led to some frustration (e.g., over the long delay in the publication of findings), WE ACT, sometimes aided by the lead academic partner, moved ahead to undertake a number of policy related steps and activities to help effect change. As Milio¹⁶ points out, policymaking proceeds nonlinearly and is embedded within changing sociohistorical contexts. Yet policy steps and activities like those below nonetheless shape the content, course, pace, and development of policy.

Problem Definition/Identification WE ACT had identified air pollution and its link to respiratory health as a key problem and policy issue well prior to the initiation of its collaboration with Columbia University researchers. By demonstrating that exposure to fine particulate matter and elemental carbon appeared related to the magnitude of local diesel sources, the Earth Crew study played an important role in providing credible evidence during the problem identification phase of the policy process.

Setting an Agenda and Creating Awareness Kingdon¹⁷ describes agendas as the list of issue areas to which government officials are paying attention. Through its focus on the relationship between the environment and asthma, the partnership played a leadership role in helping to highlight a health issue that has become a national priority and invites policy action.

Community partners, researchers and policy makers interviewed all agreed that WE ACT helped educate community residents and policymakers through broad-based public awareness campaigns including a signature effort entitled, *If You Live Uptown, Breathe At Your Own Risk* (<http://www.weact.org/programs/breathing-risk.html>). Graphically illustrated with a picture of two children in gas masks on a busy street corner, this slogan appeared in 75 bus shelter ads as well as on buttons, posters, and widely distributed brochures describing the problem. From the perspectives of those we interviewed, WE ACT's cosponsorship of conferences such as the Alternative Fuel Summit, its testimony at public meetings, its briefing of elected officials, and the press conferences it held further contributed to agenda setting and creating awareness.

Although WE ACT was front and center in such activities, the lead academic partner noted that he too had testified, attended meetings at city hall, and in other ways helped in the partnership's efforts to bring attention to the issue. Academic partners also participated in WE ACT-led environmental health workshops and informal discussions as a means of helping to create awareness and interest in environmental justice related issues in the broader community.

Constructing the Policy Alternatives WE ACT went through a deliberate process of policy-oriented research to identify targets, allies, opponents, and other forces and factors likely to be important in addressing their issues. As one community partner remarked:

...we will literally unfold charts of paper and start mapping the key actors: who is responsible for decision making, who is making policy and what is the policy...
What are the impacts on these types of policies coming out of this particular

agency? How does it play out in terms of impacting our community, our organization, and our allies?

Through this process, three government entities with the power to make the relevant policy change were identified—the Metropolitan Transit Authority (MTA), the governor, and a state legislative oversight committee. Alternative policy scenarios involving these targets also were considered by WE ACT, with the academic partner sometimes called in to provide advice and engage in discussions of the pros and cons of policy alternatives being considered.

Deciding on the Policy to Pursue Policy advocates and community organizers emphasize the need for developing a policy goal that is specific, winnable, and easy to articulate.⁵ Through both formal and informal strategic planning processes to consider policy options, WE ACT identified as its primary policy goals: (1) obtaining 300 new compressed natural gas buses in 2000–2004 and (2) having all new MTA depots converted to compressed natural gas. Although the lead academic partner sometimes participated in discussions with WE ACT staff, he noted that for researchers like himself, the motivation for involvement did not lie in identifying policy goals but rather in “trying to fill scientific gaps.” He added, however, that “what makes scientific gaps interesting [is] because there is a policy need.”

Policy Advocacy WE ACT staff engaged in a variety of activities to help achieve their goals. For example, after repeated efforts to meet and negotiate with the MTA were unsuccessful, WE ACT launched a campaign through which 10,000 postcards signed by residents were sent to the governor and the chair of the MTA. Then in 2000, after failing to get the desired results and carefully examining a range of legal tools and tactics, WE ACT took the risky but important step of joining in the filing of a legal complaint against the Federal Department of Transportation under Title VI of the Civil Rights Act. Charging the MTA with siting diesel bus depots and parking lots disproportionately in minority neighborhoods in Northern Manhattan, WE ACT and its collaborators invoked Title VI’s prohibition of racial discrimination on the part of any agency receiving federal financing.

The academic partners’ role in the policy advocacy phase of the project was quite limited, since, in the words of a community partner, “It is not natural for [researchers], based on their training, to come out and be advocates.” Yet, she added, “There are times when we need their weight and credibility as scientific researchers to say something,” and this sometimes has involved “a tug and a pull.” As noted above, the lead academic partner in the Earth Crew study did participate in hearings and meetings with policy makers and community groups, as well as presenting study findings at scientific meetings. The goal of such activity, in his words, was to “spread the word around in different settings about the partnership, the products, and the policies...” and to better integrate environmental health and justice into conversations among researchers and policy makers.

POLICY IMPLEMENTATION AND OUTCOMES

Credible research and follow up actions by WE ACT and its academic partners were described by policy makers and others as having had a substantial impact on the capital plan of the MTA, particularly in relation to the conversion of its entire bus fleet from “dirty” diesel to “clean” (ultralow sulfur) diesel. Although not what the partnership had hoped for (conversion to compressed natural gas or CNG

technology), this change was nevertheless an important step forward. A senior EPA official further commented that both the Earth Crew study findings and the community's strong advocacy played a key role in getting the government to undertake regular air monitoring in Harlem and other previously unmonitored and high-risk locations in Northern Manhattan and in other urban areas nationwide. In his words, "They [came] to us and... provided us with health information and local health studies that convinced us that there was a real problem here [and] that we ought to devote the time and energy to help this community."

WE ACT was not successful in getting a favorable judgment on its legal complaint against the US Department of Transportation. However, some of the agency's findings in this case closely mirrored WE ACT's statements and concerns. And as a community partner pointed out, the process itself "served as a point of entry for community residents" who could potentially use this potent tool in future advocacy work. Finally, and in an effort to promote more effective future collaboration, WE ACT presented a Memorandum of Understanding to the MTA on a number of issues which they have been discussing through mediation.

BROADER OUTCOMES AND POLICY CONSIDERATIONS

Although this paper has focused primarily on the municipal level outcomes of the WE ACT partnership's early Earth Crew study and its policy level activities, WE ACT went on to make progress on broader public policy fronts as well.^{8,18} As suggested by policy makers and partnership members alike, the scientific credibility WE ACT had achieved early on through the Earth Crew study combined well with the organization's effective grassroots advocacy and coalition building to enable it to play a leadership role in a number of subsequent undertakings. On the state level, for example, WE ACT played a catalytic role in working with other groups to call for a New York State Environmental Justice program, which was established in 1999. Four years later, WE ACT again played a leadership role in the development of a statewide Environmental Justice Policy that lays the foundation for new legislation and enhanced regulations in the environmental permit review and approval process. WE ACT currently is involved in the State Implementation Plan fostering state conformity to Federal air quality regulations and further is working to help develop ways in which Manhattan can come into compliance with the Clean Air Standards Act.

Finally, both WE ACT as an organization and the partnership's collaborative research contributed to federal level policy concerning environmental justice. WE ACT's Executive Director served for several years as both a member and chair of the EPA's National Environmental Justice Advisory Council (NEJAC), providing independent advice and recommendations to the Administrator of the EPA on matters related to environmental justice. And the partnership's Earth Crew study remains a frequently cited source used by the EPA and others in advocating for tighter emissions standards.

DISCUSSION

The partnership between WE ACT and the Columbia Center for Children's Environmental Health offers a useful example of a CBPR effort that appears to have both produced credible scientific research and helped bring about environ-

mental health policy change. From a research perspective, as noted above, the 1996 Earth Crew study and the WE ACT partnership's careful look at the relationship between bus diesel emissions and asthma, are still widely cited.^{8,18,19} Similarly, from a policy perspective, the conversion of New York City's bus fleet to "clean diesel," the EPA's initiation of permanent community based air monitoring in Northern Manhattan and other "hot spots," and New York's adoption of a State Environmental Justice Policy all were described in media accounts, scholarly articles, and by policy makers and others interviewed as having been substantially related to the work of WE ACT and its research partnership. As an academic partner commented, "There weren't many community based studies that showed exposure to diesel particles at that time. From a scientific perspective I think it played a role in [getting] the diesel exhaust controls." Several factors appeared to have played a key role in the partnership's success, among them WE ACT's strong community base, the scientific credibility of the partnership's research, strong policy alliances, and the careful background work and strategic planning in which WE ACT engaged. The relationship of mutual trust and respect between partners and the community partner's effective use of the mass media also appeared to have contributed to the visibility and impact of the WE ACT partnership and its policy change efforts.

At the same time, this case study illustrated what Price and Behrens²⁰ have called the tension between the "necessary skepticism of science" and the "action imperative of communities." Given such tensions (e.g., over the slow pace of publication of study findings), the importance of taking seriously CBPR's commitment to genuine colearning is underscored. Through both structured workshops and informal conversations joining together academics, community partners and residents, the WE ACT partnership attempted to address this need and meet the demands of both strong and credible science and community partners' commitments to moving at a reasonable pace into the action phase of the work.

A second lesson pointed up by this case study, and one widely discussed in the CBPR literature^{2,21-23} involves the importance of devoting sufficient time up front to developing the partnership and coming to agreement on a host of research and policy issues and strategies. As an academic partner commented:

It requires a lot of effort and energy. If you are going to do it, do it fully... If you honestly approach it with genuine interest and commitment, then it can be a very effective way to study environmental health issues that are important for disadvantaged communities.

The need for clarity on partnership goals and timetables also was stressed both in the present case study and in other CBPR endeavors.^{21,22} Further, because community partner participation in the policy arena requires a substantial time commitment over a long period, the importance of equitable sharing of resources also is underscored. The "differential reward structure" for CBPR partners, wherein outside researchers receive the lion's share of the budgetary resources, has been described elsewhere^{2,24} as a major cause of insider-outsider tensions in this work that must be carefully addressed. The WE ACT partners reported negotiating such issues, particularly as their partnership matured, and the eventual success of a federal grant on which WE ACT was the primary grantee represented an important step forward. Yet as a community partner suggested, tensions sometimes still surfaced, for instance, when budget cuts were announced that hit the community partner harder because of its far smaller initial allocation.

Still another lesson emerging from the WE ACT partnership case study, and one particularly well articulated by policy makers interviewed, involved how critical it was for partnership members to “do their homework,” particularly in determining which government agencies or individuals are likely to have decision making authority and what evidence and arguments are likely to appeal to them.

Finally, lessons were learned in relation to the policy outcomes of this project. As Themba and Minkler⁵ have noted, well framed legal actions, such as lawsuits and complaints, while carrying significant risks, remain important policy strategies. The complaint filed by WE ACT and others against the federal Department of Transportation led in part to discussions with the MTA which occurred over the last 18 months and resulted in a number of positive actions, including environmental controls at the depots and quarterly meetings with the diesel leadership team of residents WE ACT had organized at all six depots.

The outcomes of the WE ACT partnership’s policy work also demonstrated the utility of incremental change as a precursor to the broader policy goals being sought. By helping to get the entire city diesel bus fleet converted to clean diesel, for example, WE ACT, its academic partners and other allies helped pave the way for the larger goal of conversion to compressed natural gas and with it the potential for lower asthma rates and a cleaner environment. Finally, WE ACT’s leadership role in creating awareness of and leading the fight for environmental justice and the reduction in health disparities around asthma has been widely recognized and cited.^{8,18,19}

As the WE ACT partnership demonstrates, carefully designed community based participatory research that is committed to strong science, high level community involvement, engagement in policy steps and activities, and the strategic use of study findings to help impact on policy can be an important part of the broader struggle for urban health and environmental justice.

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