

Environmental Health Literacy in Support of Social Action: An Environmental Justice Perspective

Running (short) title: Environmental Health Literacy in Support of Social Action

Abstract

Different demographic groups in the United States experience unequal exposures to environmental hazards, i.e., 56% of the population in neighborhoods containing commercial waste facilities are people of color, with the associated poverty rates in those communities being 50% higher than in neighborhoods without commercial waste facilities. This presents a challenge when working to establishing healthy communities. Developing programs to educate communities about environmental hazards affecting their health and quality of life is an essential component for a community to understand their true risk. This study examined the risk of environmental hazards as perceived by public housing residents and assessed the residents' preference for educational programs on environmental hazards. Residents' perceive their risk factors in a broad context and they include environmental health risks caused by pollutants along with physical safety concerns from crime and law enforcement interactions. The most trusted sources of information on environmental health include community organizations, trusted individuals in the community and television programs. Residents have a low trust of government, at all levels, as a source of environmental health information. Recommendations for developing community-specific environmental health education programs include using sources of environmental health information that community members trust.

Keywords: Environmental health education, Environmental justice, Health literacy, Community-engaged research

Introduction

The unequal exposure to environmental hazards for residents in low-income and minority communities remains a major challenge to establishing safe and healthy communities. This is especially true for urban communities in the United States. A national study examining environmental inequities found that almost one third of low-income, urban communities hosted hazardous waste facilities (Bullard et al., 2007). Another study concluded that families living in federally-assisted public housing in metropolitan areas were at a greater risk for exposure to toxic releases of chemicals than more affluent communities (Cutter, Hodgson, & Dow, 2001). The vulnerability of these communities exacerbates environmental health disparities, thus leading to environmental injustice. Environmental injustice is the “unequal access to healthy and clean environments, including environmental amenities” (Faber & Krieg, 2002).

Effectively communicating environmental risks by using environmental health education can help protect communities disproportionately exposed to environmental hazards and address environmental injustice by increasing the awareness of hazardous exposures among community residents (Coburn, 2002; Hill, 2003; Sauvé & Godmaire, 2004). Environmental health education integrates components of environmental, health, and risk education, as well as supports health promotion, behavior change, and social action (Hill, 2003; Sauvé & Godmaire, 2004). These education components are most effective when partnered with local knowledge (Coburn, 2002; Sauvé & Godmaire, 2004).

Environmental health education programs are of little value if they do not promote health literacy (an understanding of health-related issues) that helps communities make informed choices to reduce hazardous exposure. Health literacy supports individuals in making informed decisions which can reduce health risks and ultimately increase their quality of life (Zarcadoolas,

Pleasant, & Greer, 2005). Incorporating environmental information with health concepts can assist communities in achieving environmental justice through scientific, i.e. environmental, and civic literacy (Zarcadoolas et al., 2005). Civic literacy facilitates community awareness of public issues, e.g., environmental health issues, and promotes active participation in local decision-making processes. Therefore, environmental health literacy is a tool than can assist communities achieve their environmental justice objectives.

This paper summarizes the findings from a research effort that engaged public housing residents with environmental justice concerns in the Chicago metropolitan area. This research project provides information for guiding the development of community-specific environmental health education materials. The aims of the study were to: (1) understand community beliefs and knowledge of environmental health risks; (2) determine community levels of trust regarding federal/local agencies and community groups, and; (3) identify strategies for mobilizing residents using environmental health messages and environmental health education programs.

Methods

Community of Interest

This research study focused on residents of Altgeld Gardens and Phillip Murray Homes (herein referred to as ‘Altgeld’), a predominately African-American public housing development in the Calumet industrial region (Riverdale Community Area) in Southeast Chicago, IL. Altgeld was built on top of an abandoned waste site and dozens of heavy manufacturing facilities and closed/active landfills surround the development (Figure 1). The Chicago Metropolitan Water Reclamation District sludge beds lie just north of Altgeld, and to the east are former and existing steel plants and an automotive assembly plant, which in 2010 released over 250,000 pounds of

toxic chemicals and generated over 645,000 pounds of waste (Bouman, 2001; The Right-to-Know Network, n.d.).

INSERT FIGURE 1

Many Altgeld residents are worried about their air and drinking water quality, and its impact on the rising infant mortality rate (IMR) and asthma rate (C. Johnson, personal communication, February 15, 2013). In 2000-2002, Riverdale had the highest IMR and low birth weight rates in Chicago (IL Department of Public Health, n.d.). IMR and low birth weight are related to toxic environmental exposure, especially traffic pollution (Morello-Frosch, Jesdale, Sadd, & Pastor, 2010; Kaiser et al., 2004). In addition, Altgeld's residential isolation in an industrial zone is exacerbated by a lack of access to fresh and nutritious food, essential to overall health promotion and protection. Residents fish in area ponds and grow vegetables in the soil, which raises concerns given the fact that area soil and water contains pollution. The ingestion of fish and vegetables in contact with that pollution can increase the cumulative toxicity of these substances in individuals exposed to these pollutants (Fox, 2002). This is especially notable since an area containing electrical transformers on Altgeld's property had contaminated soil from polychlorinated biphenyls (PCBs) (Adams, 2000).

Despite the multiple environmental and social challenges the community faces, Altgeld has a rich history of social support systems and community activism. Many residents with job skills and experience started training classes to educate fellow residents in different vocational areas to increase their competitiveness for available employment opportunities. There are also several resources within the community, including a community center, a public park center, a

community health clinic, and a church. Residents have also been involved in community activism as evidenced by the resident-led environmental justice organization, People for Community Recovery (PCR), which has been active in the Chicago area for over 30 years (C. Johnson, personal communication, February 15, 2013).

Research Study Design

This research study was conducted by the University of Minnesota's School of Public Health (the primary author was the principal investigator of this study) in collaboration with PCR. The U.S. EPA's Office of Research and Development provided expertise for the post-study analysis of the data and results. The research protocol for this study was approved and monitored by the Institutional Review Board (IRB) of the University of Minnesota.

Six focus groups were conducted with 42 adult residents (residing ≥ 2 years in Altgeld) at convenient community locations. Residents were asked nine questions that focused on their understanding and perceptions of environmental hazards, government agencies and community groups, and ways to address environmental problems (Table 1). Discussions were audio-recorded for transcription. All focus group participants completed a brief survey to collect additional information to supplement the discussions. Survey questions were adapted from previous questionnaires (Byrd et al., 1997; Byrd, VanDerslice, & Peterson, 2001). Respondent validation surveys were administered to an additional 48 residents to corroborate focus group findings; these additional residents did not participate in the focus groups (Cho & Trent, 2006). All study participants were compensated for their time through monetary incentives.

INSERT TABLE 1

Data Analysis

A professional transcriptionist company transcribed focus group audio recordings. Using QSR NVivo qualitative data management software (Version 2.0, QSR International), transcripts were deductively categorized and predominant themes and subthemes were identified across focus groups and cross-checked with the respondent validation surveys (Miles & Huberman, 1994). Descriptive statistics were generated for focus group and respondent validation survey data using SAS Software (Version 9.2., Cary, NC). Bivariate analyses were performed to determine differences between focus group and respondent validation participants; the level of statistical significance selected was $p < 0.05$.

Results

Demographic Characteristics

Each of the 90 study participants (focus group: 42 members; respondent validation: 48) were African-Americans ranging in age from 18 to 64 years old (focus group: mean age 45 years and median age 49 years; respondent validation: mean age 44.90 years and median age 47 years) (Table 2). Most study participants were female (focus group: 62%; respondent validation: 68%). Demographic characteristics for validation survey respondents did not differ significantly from focus group participants by age ($p=0.88$), gender ($p=0.54$), education ($p=0.49$), work situation ($p=0.09$), and current marital status ($p=0.48$).

INSERT TABLE 2

Community-Perceived Environmental Health Risks

In the focus group survey, crime, drugs, the dumping of hazardous waste, and landfills were seen as posing the greatest risks to the community. Environmental health risks were not limited to just physical risks, but also included social risks such as crime and police brutality. One focus group member stated: “The risks in our environment have a lot of different categories besides dealing with the pollution in the air, in the soil, in the water. It’s a risk just walking to your house.” There were also concerns about adverse health effects which could possibly be linked to local environmental pollution: “If you looked at all the people that have been living out here that are dying from cancer, that’s not a coincidence.” Table 3 provides a detailed list of perceived environmental health risks.

INSERT TABLE 3

Community-Trusted Sources of Environmental Health Information

The majority of focus group participants reported getting “a fair amount” to “a lot” of information about the environment from PCR (67%) and television programs (60%). Approximately 45% of focus group participants reported that friends/relatives were their primary source of environmental information. Government agencies were not a major source of information, as only 41, 36, and 31% of focus group participants reported receiving at least “a fair amount” of information from the U.S. EPA, the Illinois Department of Public Health, and the Chicago Department of Public Health, respectively. Focus group participants believe they received the least amount of environmental information from private industry. When discussing local water testing, one focus group member stated, “I can see the water pollution people. They

take a sample of the water. They're testing it to see how much pollution is in the water, but we don't get no information about it. We don't get no feedback on the results."

Community Trust in Government

Many focus group participants did not believe federal/local agencies were adequately protecting their health, nor did they trust government agencies. One frustrated focus group participant stated: "We live in pollution... [A past elected official] let us be in this [word deleted]... We have a [word deleted] factory over here. They're building all around the hill and we're living around it. Our water... the smell.... comes through the sewage system. I was standing one time by the drain, they sent it through there and I damn near fainted. That stuff will kill you and we stand around. They [elected officials] let them send it out at certain times. They send it out at night when we are asleep. Do you know they're killing us?" Similar statements were recurring throughout focus group discussions.

Community-Focused Environmental Health Messages

As most focus group participants indicated they received most of their environmental health information from the resident-led organization, PCR, and friends/relatives. Focus group discussions emphasized building on existing communication channels when relaying health messages. They recommended creating a residential network with respected residents from the neighborhood that have been trained in environmental health issues. Once trained, these residents would educate other residents on community-specific risks and mitigation strategies. One focus group participants suggested the creation of resident-led committees: "We need to form subgroups or subcommittees... and focus on certain areas where we want to gather information and become sort of experts... doing research." Focus group participants believed residents were the best source of information because they communicated in a language that was understandable

and knew the best ways to engage other residents. In addition, residents would be more receptive to community members when discussing community concerns.

Discussion

This study provides a clearer understanding of one community's perceptions of environmental health risks, trust level of agencies, as well as specific strategies to develop and disseminate environmental health messages. Focus group discussions, as corroborated by respondent validation surveys with additional study participants, identified several community-specific environmental health concerns. In general, friends/relatives were focus group participants primary and trusted source of environmental information. These participants also did not trust federal/local agencies, nor did they feel these agencies were protecting their community's health. Suggestions for community-specific environmental health messages were provided and included utilizing community members to disseminate health information.

Focus group discussions in this study reflect the findings from similar studies that examined community perceptions of environmental health risks to inform health education programs (Taylor-Clark, Koh, & Viswanath, 2007; Corburn, 2002; Evans, Fullilove, Green, & Levison, 2002; Green, Fullilove, Evans, & Shepard, 2002). As with similar studies, participants had a broader definition of environmental health risks, which incorporated risks from the physical and social environments. This broader definition must be considered when designing programs and tailoring health messages, especially for low-income communities with environmental justice concerns, as the purpose for tailored messages is to inform, raise awareness, and encourage residents to work for environmental justice in their communities. Furthermore, engaging community members in the identification of risks can ensure health

messages are both culturally and socially appropriate. When considering the fact that nearly 45% of the focus group members self-report their health status as fair or poor, it is imperative that community residents be fully included in development of environmental health assessments and associated education and outreach programs.

Focus group participants also believed that many of their concerns were not being addressed by local agencies, and that local officials stand idly by while pollution is generated and released into their community. This observation is indicative of the belief by some participants that they have been abandoned and ignored by the different levels of government when it comes to their health and physical well-being. Participants also expressed a low level of trust in government agencies and did not believe they were receiving enough information. If these agencies were to communicate health messages, residents would have a difficult time believing them and might reject the health messages. Some residents believe that their elected officials intentionally allow companies to poison their community. This level of distrust would make it difficult for any agency to effectively disseminate health information to residents.

While participants did not exhibit a great deal of trust towards agencies, they did cite PCR, the resident-led community organization, as a significant source of environmental health information. Participants stressed the importance of using local agencies, such as PCR, to communicate health messages because they have established trust relationships with community members. In addition, focus group participants identified friends and relatives as reliable sources of environmental health information. Several participants suggested creating a resident environmental health network. As residents, the trained advocates would be able to effectively engage other residents and to communicate with them in a socio-culturally appropriate way.

Utilizing a community health worker approach through a resident-focused network to communicate environmental health risks is a viable strategy to develop community-specific environmental health messages. Several studies have demonstrated the effectiveness of community health worker interventions in the reduction of environmental health risks, especially with low-income communities (Krieger, Takaro, Song, & Weaver, 2005; Bryant-Stephens, Kurian, Guo, & Zhao, 2009; Perez, Findley, Mejia, & Martinez, 2006). These interventions are especially effective at empowering communities to address social injustices, i.e. environmental injustice (Perez et al., 2006). Using a community-engaged research approach through the Centers for Disease Control and Prevention's Prevention Research Centers (PRCs) is another strategy to develop community-specific environmental health messages. Community-engaged research approaches can enhance trust between community members and academic institutions by incorporating community input to community-specific research efforts (CTSA, 2011). Research projects conducted at PRCs have improved health outcomes among low-income communities by tailoring interventions to meet community needs (Gustat et al., 2012; Strunin et al., 2010).

Conclusion

This research effort adds to existing evidence that low-income community members are interested in increasing their knowledge of the environmental risks and want to be actively involved in risk analysis and risk reduction efforts in their local area. The findings indicate that more applied research activity should be conducted using the results of this study. Follow-on research projects should be designed based on the outcome of this project and should focus on quantitative measures of the impact that increased health literacy can have on: improved civic engagement (i.e., increased interaction with local political and industrial leaders on community issues); improved knowledge of environmental health risks, and; improved community health

outcomes (i.e., based on community-based and community-led health education programs).

Resources should be directed towards an applied research effort working with a well-organized community partner like PCR to objectively measure the effect of improved awareness of environmental health risks.

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Author Disclosure Statement

The authors have no conflicts of interest or financial ties to disclose.

Disclaimer

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Focus Group Questions

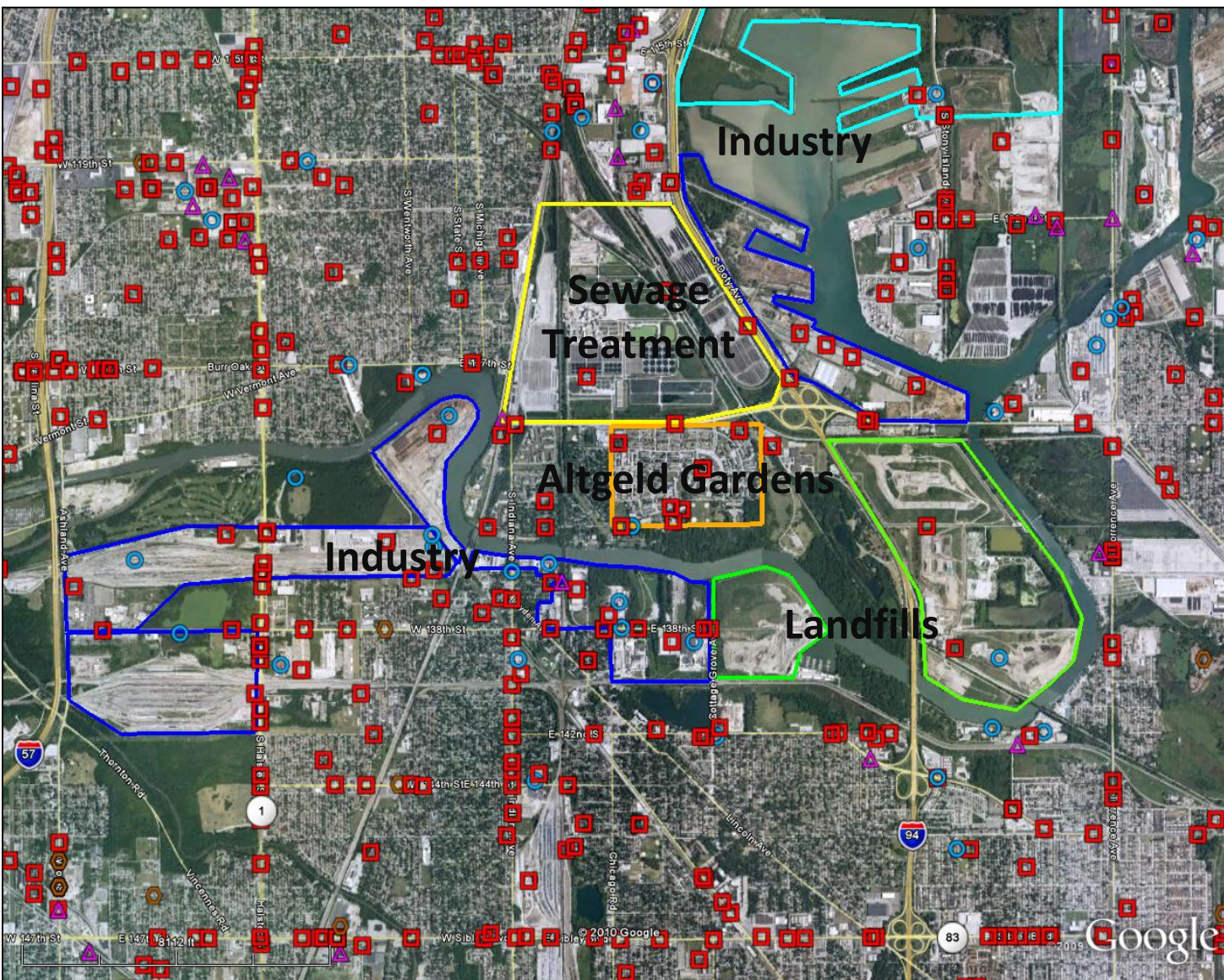
#	Question/Comment
1	What are environmental hazards?
2	What environmental health risks are present in your community?
3	How effective are government agencies in protecting your community's health?
4	How effective are environmental groups in protecting your community's health?
5	What do you do to protect your health from environmental health risks?
6	What should be done to address environmental problems in your community?
7	Describe how you can bring your community together to protect against environmental hazard
8	Describe the type of information that would get your community to do something about environmental hazards.
9	Where would you like to get this information?

Participant Demographic Characteristics





	Focus Group (N=42)	Respondent Validation (N=48)
Gender		
Male	38%	32%
Female	62%	68%
Age		
Average, years	45.09	44.90
Median, years	49	47
Education		
High school graduate	48%	36%
Some college and beyond	31%	30%
Employment status		
Unemployed	36%	30%
Current marital status		
Married	12%	16%
Never been married	55%	36%

Community-specific Perceived Environmental Health Risks

Poor Air Quality	Outdoor: Near roadway pollutants (Interstate 94) Industrial emissions Odor (Metropolitan Water Reclamation)
	Indoor: Mold Environmental tobacco smoke Lead
Land Contamination	Illegal dumping
	Landfills (Land & Lakes landfills, CID Landfills – Note: <i>CID Landfills</i> are permitted to store commercial hazardous wastes and are governed by the Resource Conservation and Recovery Act [RCRA] of 1976, as amended)
	PCB contamination
	Home gardens and soil contaminants
Environmentally Related Illnesses	Infant mortality
	Cancer
	Asthma
	Lupus
Poor Water Quality	Fish consumption advisories (Little Calumet River)
	Contaminated drinking water
	Sewage overflow



Environmental Hazards

-  Hazardous Wastes (RCRA)
-  Toxic Releases (TRI)
-  Superfund Sites (CERCLIS)
-  Brownfields (ACRES)