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## Perceptions of Environmental Health Risks and Communication Barriers among Low-SEP and Racial/Ethnic Minority Communities

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*Abstract:* Despite a disproportionate burden of environmental hazards in lower socioeconomic positions (SEP) and racial/ethnic minority communities, research suggests that such communities may have concerns about environmental risks different from those of their higher SEP and White counterparts. These groups also face disproportionate barriers to accessing and utilizing public health information. Little work has focused on the environmental risk communication barriers that low-SEP minorities face. This paper reports on the results of seven focus groups conducted in three low-SEP Massachusetts communities, with an over-sample of racial/ethnic minorities. We explored (1) definitions of the environment, (2) perceptions of environmental health effects, (3) information-seeking behaviors around these issues, and (4) challenges to accessing and utilizing information. The local environment shapes these communities' perceptions of environmental risks; they face considerable barriers to accessing, understanding, and utilizing other sources of information about environmental health risks. We discuss the implications for future targeted campaigns to reduce negative impacts of environmental health risks.

*Key words:* Focus groups, health communication, communication barriers, communication inequality, health disparities, environmental health.

People's potential for social action and mobilization is influenced by how they perceive a social condition as a problem and the information that they have to mobilize and act on resolving that problem.<sup>1,2</sup> The potential for mobilization to prevent or address social problems is hindered if there are barriers to accessing information about a particular issue.<sup>1</sup> In this study, we assessed how members from low socioeconomic positions (SEP) and racial/ethnic minority communities perceive the issue of environmental risks and their connections to health. We were specifically interested in exploring how communication behaviors and perceived barriers to accessing rel-

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evant information are associated with perceptions of how to prevent and respond to environmental health risks.

A study of low-SEP and racial/ethnic minority groups' perspectives on the environment and communication barriers is critical because there is strong evidence of disproportionately greater environmental health burdens within these communities.<sup>3-6</sup> For example, even after controlling for economic factors, research shows that environmental factors such as psychosocial stress brought on by residential segregation, or higher pollution rates concentrated in urban centers, may increase cancer morbidity and mortality, among other health problems, in racial and ethnic minority and low-SEP communities.<sup>7-9</sup>

## **The Environment and the Underserved**

Despite disproportionate exposures to environmental health hazards, among low-SEP and racial/ethnic minority communities, early research suggested that these groups were less concerned than their wealthier or White counterparts about environmental risks to health.<sup>10,11</sup> More recent research documents differential environmental health definitions by race and class, but equivalent or greater levels of concern about perceived risks among racial minorities.<sup>12,13</sup> Neighborhood environmental problems, such as noise pollution, abandoned housing, environmental tobacco smoke, litter or garbage, pests and roaches, and exposure to lead, are of greater concern among Blacks,<sup>14</sup> while their White counterparts are more concerned with the health effects of ozone layer depletion and global climate change.<sup>10</sup> In a related vein, Whites exhibit higher scores relative to Blacks on perceiving positive economic benefits associated with pro-environmental behaviors.<sup>13</sup> These variable definitions and perceived outcomes may lead to different actions to address the health effects of a poor environment on the part of the two groups.

Access to effective information, among other factors, may shape public perceptions of and actions around environmental health threats.<sup>1</sup> Thus, it is critical to understand how communication inequalities affect environmental risk perceptions among vulnerable groups in order to assess appropriate risk communication strategies to promote effective prevention and response measures. While some research focuses on understanding racial differences in perceptions of environmental hazards,<sup>11,13,15</sup> little work has focused on the communication barriers around environmental health issues that racial/ethnic minorities and people in low-SEPs face.<sup>16</sup>

## **Communication Inequalities, the Environment, and Health**

The guiding theoretical framework for this study comes from our most recent work on communication inequalities and their implications for population health.<sup>1</sup> We define *communication inequality* here as differences in communities' abilities to access, process, and utilize health information, likely leading to increased barriers facing socio-economically vulnerable individuals and groups.<sup>1</sup> (See Figure 1.)

Such differences have been widely documented in the literature. For example, members of lower SEP groups are less likely to access and utilize the Internet, read

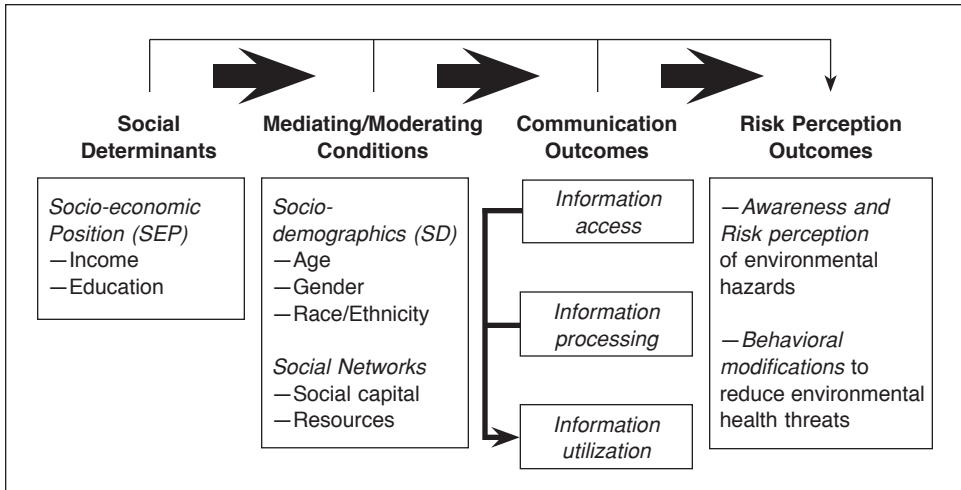


Figure 1. Structural influence model of communication inequalities on the environment and health. For information on the structural influence model see Viswanath, Ramanadhan, and Kontos, 2007.

newspapers, and actively seek information on health.<sup>1,17–20</sup> Indicators of SEP such as education and income are strongly correlated with access to other information delivery services such as subscription to satellite and cable TV and the Internet.<sup>1</sup>

One study drawing on national data reported that income and education are associated with daily readership of newspapers. Respondents earning \$50,000 per year were significantly more likely than those earning less than \$25,000 per year to read the newspaper. Use and reliance on media may also be influenced by race. On average, African Americans spend more time with television, but less with newspapers, and have less access to Internet, cable, and satellite TV than do their White counterparts.<sup>21</sup>

Media use and reliance also varies by ethnicity. For example, immigrants and non-native speakers of English (almost 18% of the U.S. population age five years or older) are less likely to rely on mainstream English media and instead rely on ethnic media than are native speakers of English and non-immigrants.<sup>22</sup> Spanish speakers and self-identified Latinos are less frequent users of media, such as newspapers and magazines, than native English speakers and non-immigrants, although Spanish speakers and immigrants are heavy users of electronic media such as radio and television compared with the rest of the U.S. population.<sup>23</sup> The content of ethnic media (i.e., media targeted to racial/ethnic minority populations and issues), however, may vary considerably, especially when compared with the English language media.<sup>22</sup>

The complexity of the issue of health effects from the environment may widen disparities in knowledge and action, which may also deter low-SEP and vulnerable groups' capacity to act on information to ameliorate their conditions. One case study exposed the challenges that low-SEP minority communities face in effectively communicating and acting on information to reduce environmental health risks. Concerned about the high rates of asthma in their neighborhood, a group of youths in a low-income

community of Roxbury, Massachusetts, organized to clean up diesel exhaust and raise awareness about the potentially negative health consequences associated with exposure.<sup>24</sup> Although they were able to mobilize a campaign, they were unable to raise community awareness appreciably. Barriers to raising community awareness included facing high scientific uncertainty about the cause or spread of diesel emissions, recognizing multiple causes of poor health outcomes that could be associated with exhaust exposure, and diffusion of diesel exhaust in time and space (which resulted in no single dominant cause of consequent health problems).

## Public Health Campaigns and the Underserved

Public health campaigns have been used in health promotion and disease prevention in a variety of areas including: tobacco use, obesity, vaccination, and safe sex practices, with mixed success.<sup>25,26</sup> While there is potential for unequal benefits from campaigns to accrue between social classes, carefully conceived campaigns could serve to reduce communication gaps by targeting appropriate channels and sources of information, while presenting culturally relevant messages.<sup>27,28</sup> For example, low-SEP racial/ethnic minorities may trust different sources of information on environmental health threats than those presented through broad communication channels, which may lead to differential interpretation and action on messages.<sup>23</sup> Therefore, presentation of culturally relevant messages may reduce knowledge gaps and thus facilitate effective actions.<sup>26,29</sup> Understanding how these factors play a role in reducing uncertainty about environmental health risks is particularly important when targeting environmental health campaigns to low-SEP minorities.

## Research Questions

We explored several questions to get a better understanding of low-SEP and racial/ethnic minority communities' (1) definitions of the environment, (2) information-seeking behaviors related to accessing information on the environment and health, and (3) challenges to utilizing that information effectively. First, how do people from low SEP groups define *the environment* and how do they perceive the effects of environmental risks on their own and their communities' health? Second, what are their information-seeking behaviors on issues of the environment and health? In particular, do they have access to trusted communication channels? Whom do they trust as channels and sources of information? Third, what are some challenges they face in accessing and utilizing information and how do they resolve these challenges?

We seek to answer these questions in order to help different stakeholders to formulate a strategic risk communication plan on environmental health threats in low-SEP minority communities.

## Methods

**Background.** The data for this study come from seven focus groups conducted between October 1, 2006–November 1, 2006, made up of lower SEP participants in

three Massachusetts' communities: Lawrence (two groups), Boston (three groups), and Worcester (two groups). The three cities are diverse, varying in their ethnic, racial, and social class makeup (Table 1). The communities are also sites for work by the Massachusetts Community Network to Eliminate Cancer Disparities through Research, Education and Training (MassCONNECT), a community network project funded by the National Cancer Institute (NCI), under whose auspices this study was done.

**Variables and measures.** The variables of interest that influenced the development of the focus group guide were drawn from an extensive review of literature (see Appendix A). The questions in the guide were adopted from major national surveys, including the National Cancer Institute's (NCI) Health Information National Trends Survey (HINTS), and surveys used by national organizations such as the Kaiser Family Foundation (KFF), the Robert Wood Johnson Foundation (RWJF), The Gallup Organization, and Harris Interactive Polling, among others. Finally, we consulted with key informants working in environmental health and the three MassCONNECT community partners: The Greater Lawrence Health Center (Lawrence), Common Pathways (Worcester), and REACH 2010 (Boston). We developed the questions to elicit qualitatively communities' definitions of the environment and the environment's connection with health; health and environment information-seeking behaviors; and challenges to accessing and utilizing information on health and the environment. One moderator conducted all of the focus groups with the exception of the Lawrence groups, which were moderated by a Spanish-speaking consultant. This consultant also translated the guide and screener into Spanish for the Lawrence focus groups.

**Sample and recruitment.** *Participant Recruitment.* We recruited participants for most of the focus groups in coordination with the MassCONNECT community partners. We also collaborated with a private focus group firm for recruitment of participants in two of the Boston focus groups. We identified participants through flyer and e-mail solicitations, as well as word-of-mouth invitations in various community outreach group meetings. A research assistant was responsible for all screening and call-backs in the Boston focus groups. A representative from our community partners in Worcester was

**Table 1.**  
**DEMOGRAPHICS OF PARTICIPANT COMMUNITIES**

	Boston	Worcester	Lawrence
Population	589,141	172,648	72,043
% Below poverty level	20	18	24
% Racial/ethnic minority	51	29	66
Median household income	\$36,629	\$35,623	\$27,983
% High school graduates	24	29	30
% College degree	20	14	6
% Born outside U.S.	3	6	13

Source: U.S. Census Bureau, Census 2000.

**Table 2.****FOCUS GROUP PARTICIPANT  
DEMOGRAPHICS AND BACKGROUND**

Characteristics	Boston groups	Worcester groups	Lawrence groups
Total in sample	24	18	9
Ethnicity			
African-American	16	5	0
Caucasian	6	9	0
Latino/Hispanic	1	4	9
Other	1	0	0
Gender			
Men	6	8	0
Women	18	10	9
Income range			
Less than \$5K	6	2	0
\$5–10K	3	6	0
\$10–20K	5	8	2
\$20–26.5K	5	1	2
\$26.5–33.5K	2	0	0
\$33.5–40K	2	1	0
\$40K+	1	0	5
Education			
Less than high school	0	5	3
High school/GED	3	13	2
Some college/vocational	21	0	4
Average household number	2.5	2.3 <sup>a</sup>	3.7

<sup>a</sup>Five participants lived in a shelter, so were not included in calculation.

responsible for recruitment, screening, and call-backs for both groups in Worcester. Finally, staff members of the Greater Lawrence Health Center were responsible for recruiting participants in Lawrence.

Five groups were conducted in English, while the two Lawrence groups were conducted in Spanish. Altogether, we recruited 51 participants for the study (Table 2).

*Eligibility criteria.* We screened all possible focus groups for the following criteria:

- Household income 200% or more below the federal poverty line (FPL);\*
- Two years college education or less;
- A mix of racial ethnic backgrounds, with an over-sampling of African Americans and Latinos;
- A mix of genders, with an over-sampling of women.

\* Roommates' net income was not considered as part of a households' income.

**Incentives.** Each participant received \$25.00 for his or her participation and between \$5.00 and \$10.00 for travel expenses. Participants were also given resource sheets, which included contact information for environmental and health organizations and agencies in the Commonwealth of Massachusetts and in their communities. These materials were collected collaboratively with The Boston Public Health Commission and The Worcester Department of Public Health, and were augmented with regional and local environment and health resources collected on the Internet.

**Procedure.** One moderator conducted each 90-minute group. Two note-takers recorded thematic and focus group notes to aid in transcription. Each session was tape recorded and professionally transcribed.

**Analysis.** The Project Director and a research assistant analyzed the focus group transcripts for major themes by noting all responses to each segment of the questionnaire in one document and then flagging those responses that were mentioned more than once. We report responses here that were identified by more than one respondent. We do not report Lawrence respondents' quotations *verbatim* because of our concern that the translation from Spanish to English may be imprecise. Thus, where appropriate we discuss the thematic results of the Spanish-speaking groups, but do not directly quote respondents.

## Results

Our research questions focused on three broad areas: how members of low SEP groups define *the environment* and perceive the effects of environmental risks on their own and their communities' health; information-seeking behaviors around environment and health; and challenges and barriers participants face in accessing and utilizing information on the environment, and how they resolve those challenges.

**Definitions of *the environment* and perceived effects on health.** Definitions of the environment were grounded in the reality of participants' day-to-day living and working conditions. While participants described a broad range of potential environmental hazards to health, including safety of air and water; second-hand smoke; toxicity of housekeeping sprays; poor worksite conditions; quality of soil, grass, and trees in their communities; ecosystem issues and global warming; drugs and violence in their communities; and food safety, they seemed most concerned with local problems (e.g., unclean water supply) and inadequate housing conditions (e.g., pests and rodents).

For example, participants in several groups noted fear that lead and other chemicals pollute the water supply and soil in poor and minority neighborhoods.

I'm just so scared . . . there's lead and everything in that [the water supply] . . . it's probably in the bottles, too. Who . . . who do you trust? (White female, Boston, aged 42)

We don't know what's in our soil, either . . . when I was kid, I grew up in Somerville . . . there was a company over there and . . . we used to call it "the barrel company." But, inside those barrels . . . they were loaded with chemicals . . . So, all those barrels were there, and there was . . . seepage, everywhere. There was stuff all over the ground . . . green stuff and weird stuff and slimy stuff and all that kind of stuff . . . we were kids, we used to play around in there. (White female, Boston, aged 56)



Interestingly, many participants expressed distrust of authorities and others responsible for maintaining the participants' living and working conditions.

Participant: I'd just like to know more . . . what's in it, what they're usin' . . . and . . . what can be done about . . . because I think they're sprayin' . . . they say they're sprayin' to keep you from gettin' things, but my household . . . like I say, I find we get sicker, every time they spray.

Moderator: The bugs, you mean?

Participant: Sure, and they don't tell you . . . (Participant: African American female, Boston, aged 50)

Boston participants noted that inadequate neighborhood and housing conditions are likely to cause asthma, which was perceived to be the greatest threat to their children's health.

Moderator: What do you think are the biggest threats to you or your family in your neighborhood . . . ?

Group: [Everyone concurs—asthma]

Moderator: Asthma? Why is that?

Participant: We're always trying to do things, um, because we have a lot of children in our neighborhood—a LOT of asthmatic children. And, uh, the buses . . . It's like livin' in a soot factory . . . my . . . living room window faces the avenue and . . . you can write your name on my tables, and . . . I can polish 'em tomorrow, and if I open that window, the next morning, you can write your name again. All that crap's coming, and children are breathin' it in. (African American female, Boston, aged 50)

I actually had somebody come in from the health department to test the . . . air in my apartment, 'cause my daughter kept havin' asthma attack. Now, she was nine. Then I moved from one apartment to the next apartment. In the first apartment, she never had a asthma attack. Movin' to the new apartment, she had a asthma . . . kept havin' asthma attacks, over and over. And they found out that—they paint the ceilin's with this sand paint? There was something in that paint, that they had . . . You know, when they have . . . like, out there, sprayin' the trees and grass and stuff? They really don't know what's in those chemicals and how people are gonna react. 'Cause I know, I got a tree growin' in front of my window, and the housin' authority, we be like fightin', every time they spray, 'cause they lose a branch, . . . [but] I can't breathe. But they tell me there's nothing in that spray that is settin' the asthma off. (African American female, Boston, aged 50)

If you be workin' in housekeeping, or if you do demolition, or . . . construction work . . . you inhale it, and so, it can cause those cells in the lungs, you know, it become cancerous. Those kind of things, and like asthma . . . the polluting air from the air-planes, the buses, the trucks that don't get their tuneups, and cars, how a lot of children in the city of Boston, Dorchester, Roxbury, Mattapan, those areas, are now prone to have asthma. None of my kids had asthma till I had my last child. She had asthma . . . she has asthma where she's been hospitalized, numerous times, and it's because of the . . . environment. (African American female, Boston, aged 41)

Worcester participants described a slightly different relationship between the environment and health, possibly because of the relatively larger proportion of homeless people in those groups (see Table 2). While some participants mentioned water quality as an environmental health concern, others noted diabetes, hepatitis A and C, thyroid, tuberculosis, asthma, HIV, and cancer as major health problems caused by the environment. Of those diseases, the group raised concerns about the environment that appear to stem from their living conditions (such as pests and insects).

Moderator: I'm gonna read a list of things that might be a problem in some of your communities . . . do you think air pollution is a problem in your specific community? And, if you do, why . . . ?

Participant: No, no . . . My problem . . . at the shelters . . . we got cockroaches . . . (Unidentified participant, Worcester)

Participant: I was homeless for a period of time, but . . . I wanted to have a place to live. I just, I live in a one-room apartment house. Those are bad, too . . . Mice there, uh, roaches there, rats there . . . (Unidentified male, Worcester)

Many participants in all groups cited environmental racism as a major cause of health problems in their communities.

Moderator: But, do you think some of the diseases that are . . . or, health issues that are caused by a bad environment, um, affect different communities in Massachusetts, differently?

Participant 1: Definitely, yes . . . I always play the race card, but it's so . . . (African American female, Boston, aged 47)

Participant 2: No, it's true. It's extremely true.

Participant 1: "We'll fix your schools up, but we're gonna fix these schools up, first . . . We'll give you so many tax dollars per child here." But, so, I think the poorer neighborhoods are gonna have a worse environment. (African American female, Boston, aged 47)

Some of the Spanish-speaking participants from Lawrence noted that in the adjacent, relatively wealthy neighborhood, water and housing conditions are much better, but that the conditions deteriorate as soon as one crosses the line into Lawrence.

#### **Information-seeking behavior and trusted channels and sources of information.**

For the most part, the participants did not actively search for information on the environment and health unless they had a specific question or concern. Yet, information seekers provided insight into their access to and utilization of information on environmental risks to health.

*Internet.* In addition to their doctors, many participants in each group said that they would use the Internet as a major source of information on environmental health risks. Community organizations and libraries were an important venue for people to access information from the Internet when they did not have a connection in their homes or workplaces.

Many said that they first go to a search engine, such as *Google* or *Yahoo*. Others in the Boston and Lawrence groups said that they go directly to *health-related sites*, such as WebMD and the American Cancer Society (ACS) to get a better understanding of the effects of the environment on cancer outcomes. Others trusted online newsletters to which they subscribed, including diabetes-related organizations.

When asked about how participants assessed the quality of information on the Internet, given the large amount of information that they encounter, many said that if their search is through an engine such as Google or Yahoo, they usually accepted the first few hits from their search as being of high quality. Others considered sites by nationally visible organizations, such as the American Cancer Society, to have high quality information.

**Newspapers.** Local newspapers such as *The Boston Globe* and *The Boston Herald* were cited as important sources of news on environmental and health issues. Boston and Worcester participants also cited neighborhood and community newspapers such as: *The Banner*, *The Voice*, *The Hyde Park Gazette*, *South End News*, *The Mission Hill News*, *The Alewife* (which is dedicated specifically to environmental news), *Dorchester Community News*, *The Eagle Tribune*, *The Telegram*, and *The Metro* as being important information sources about health. Participants in the Lawrence groups cited Spanish language local newspapers, including *Siglo 21* and *El Diario* as important health and environment information sources.

**Television.** Local television news' physician correspondents were cited as trusted sources of health information in every city. Fewer participants also cited cable news television programs as having trusted information on health and the environment. Specifically, several participants discussed the *Discovery Channel* and the *Women's Health Network* as important sources of information.

In Lawrence, where focus groups comprised Latinas only, *Univision* was identified as an important channel of information on these issues, reinforcing the idea that ethnic media are vital sources of information for immigrant groups. Similarly, in Worcester, Spanish-speaking participants noted that they prefer Spanish-speaking television because they can trust that they are getting the whole story about issues.

Because there's Spanish television, they get it right. They show you a graphic and they don't . . . they give you more than American TV. Am I right? Yeah. They give you a lot more information. Everything's censored with Channel 4 . . . (Latina female, Worcester, age unknown)

**Family and friends.** If they do not have access to the Internet, participants said that they consulted family and friends for information about their health (particularly after they had discussed health issues with a physician). One respondent stated that he still trusted "old-fashioned remedies from Ma." They also suggested that they use family and friends who have scientific knowledge about environmental risks to health if they want to confirm facts that they have heard or read.

**Community organizations.** Many participants said that community organizations provide important information on health (and the environment) through concise information pamphlets, videos, and communication with health care workers.

Participants in both the Boston and the Lawrence groups cited churches as important and trusted channels to disseminate health information. One participant brought a flyer to the group to invite others to her parish to watch the Al Gore film on global warming, *An Inconvenient Truth*, which she said had been donated to her church by the Al Gore Foundation.

In Worcester, participants mentioned community watchdogs and advocacy groups as trusted sources of information.

[One good source of information is . . .] I think it's called Mass PIRG, or somethin' like that . . . Yeah, they're a watchdog group . . . that's their . . . thing, the environment. (African American female, Worcester, age unknown)

. . . the environmental people . . . they're trained in that field, they know what's goin' on. . . . I'd rather hear it from them, right from the horse's mouth: "This is what's goin' on, this is how you can work on it." (African American female, Worcester, age unknown)

**Other sources.** A few participants in the Boston and Lawrence groups also cited medical dictionaries and the "CVS Pharmacy medical dictionary resource," in particular, as important sources of information about health issues that may be caused by the environment.

**Challenges to searching for information on the environment and health.** Participants cited several issues that cause frustration and stress when searching for information, which may lead to decreased trust in information channels and sources on health and the environment.

Barriers to getting information included lack of access to information channels (e.g., the Internet), inability to navigate communication channels, and presentation of too much information on one topic. Although most participants in this study had some access to the Internet, whether from home, work, or community organizations, those who did not have access more often noted difficulty in finding information about the environment and health. Those with access to the Internet felt that it was difficult to find the needed information on websites; one said, "You can't find the right information, and then you click on the link, click on a link, click on a link . . ." Even when they succeed in finding information on a topic, participants reported frustration when too much information was presented on the websites. When confronted with large number of sites and information, they are likely to feel overwhelmed and often discontinue their search for more information.

Barriers to processing and interpreting information included presentation of information from a biased source, complicated language, and presentation of contradictory scientific findings. For example, participants noted that they are "less likely to trust politicians and business representatives as sources of health and environment information" because they viewed these sources as biased. Participants also noted feeling "overwhelmed when sources use complicated technical terminology to describe specific health and environment issues—If they would just . . . word it simply, they go all the way around the world to make a point!" This barrier was of particular concern for participants in the primarily Spanish-speaking Lawrence groups, many of whom

suggested that the way information is presented is not only too wordy and complicated, but often gives rise to awkward or inaccurate translations from English to Spanish. Finally, many respondents stated that they no longer pay attention to this type of information or news, because of regularly occurring contradictions—"you're damned if you do, you're damned if you don't."

**Resolving challenges and preferred forms of information presentation.** Participants coped with barriers (such as information overload, lack of trust, and contradictory information) in a variety of ways. One commonly mentioned strategy was to rely on a trusted source for guidance on exactly where (on the Internet, for example) to look for solid, clear information on a specific subject.

They also relied on their sources to advise them on when to seek or not to seek more information. One cancer survivor noted, "And I had my surgeon say to me, 'Please stop looking on all these sites' . . . [The surgeon suggested] the American Cancer Society . . . site . . . where she said 'please don't go to all those other sites.' Because she agrees—You get so overwhelmed."

Many participants preferred to have information presented using "personal stories that describe just-the-facts—give it to me quick and in a nutshell."

Finally, participants preferred several trusted channels to get information on health and the environment for underserved communities, including mass mailings (coupled with coupons in the mail) and health and community fairs, such as Earth Day.

I think if Worcester had, like . . . places, like, Genesis Program . . . If there was . . . more . . . community meetings where everybody's allowed to go in. Not just like your politicians, or . . . your high people who . . . do the tax and stuff. Like, if they had a place where just regular people—people on the street . . . who can sit there and say, "Okay, here's the format. This is what we're talking about. How can we make Worcester better?" If they had more meetings like that, I think more people in Worcester would be more aware and maybe even care more if they were more involved in what's goin' on in [the environment] in Worcester . . . (Caucasian female, Worcester, age unknown)

## Discussion

The focus groups reported here underscore the findings of recent research, which suggest that low-SEP and racial/ethnic minority communities define the environment in many ways, but are most concerned with the health effects of the local environment, particularly their housing and living conditions. Participants in the Boston groups were particularly concerned with the effects of local pesticide spraying (in their housing and in their neighborhoods) on the asthma rates of children and cancer rates of adults in their communities. Worcester participants, on the other hand, defined environmental problems based on their day-to-day living conditions.

Second, participants mentioned a variety of channels on which they rely for information about the environment and health. Given that the data are from focus groups where participants were asked specifically about different channels, we cannot reliably infer whether all the sources mentioned here are also sources from which the larger

population gets its information. But, these data do suggest that strategic communications on environment and health must take into account the media mix when planning communication outreach.

Even as they mentioned a variety of environmental problems stemming from their living conditions, participants noted several challenges to seeking and processing environmental health information effectively. These include information overload, frequent dissemination of contradictory information given the uncertain nature of science, and complex language.

One interesting and significant solution emerged from the discussion of barriers to information-seeking: organization of information. For example, a large number of participants in our focus groups mentioned the Internet as one important channel of information. Although this finding goes against the well-documented reports of the digital divide,<sup>30</sup> the nature of access mentioned is instructive. Membership in community and church groups and using public libraries increase the chances that participants have access to the Internet. Even with access to this communication channel, many face challenges in searching for and processing that information. We noted that navigation of the Internet and presentation of too much technical and complicated information reduced participants' chances of continuing their searches. This finding is important because burgeoning research shows inequitable access to current health information that is broadly distributed through major channels, such as the Internet. Indeed, this research finds that low-SEP and other vulnerable groups may have reduced access and ability to process and utilize public health information that is currently provided on the Internet.<sup>30</sup> Thus, information campaigns seeking to raise awareness about and change actions around environmental health risks, should present concise and uncomplicated materials. Providing information on a specific website or channel to guide information seekers in searching may reduce frustration caused by an inability to navigate information channels properly.

Further, where scientific uncertainty exists, participants called for transparent messages that provide only the facts about known environmental health risks. Participants noted that messages that are personalized have a greater impact on behavioral modifications to control risks, which is supported by some literature in the area of modeling.<sup>31,32</sup> Work in message "tailoring" suggests that strategic communications can be personalized based on recipients' demographic and psychological determinants, which helps to address their individual circumstances.<sup>33-35</sup>

## Conclusion

Risk communication literature supports the view that policy and public health officials must focus on public perceptions of environmental hazards in order to reduce the overall risks associated with such threats.<sup>36-38</sup> Incorporating community concerns into the planning of environmental campaigns will be imperative to the success of efforts to reduce environmental health risks, particularly in disproportionately vulnerable areas. We show here that the information environment and day-to-day living and working conditions strongly influence how socio-economically vulnerable communities perceive environmental matters. Providing relevant information to increase 1) community

awareness of public health threats and 2) protective strategies that communities can act on, will be imperative to reducing environmental health burdens.

Addressing information gaps, defining the nature of environmental problems in health, and facilitating mobilization requires a shift in the mindset from focusing only on individual level variables such as risk cognitions and perceptions, to larger structural conditions such as social class, communication inequalities, and social, health-related, and environmental policies (including homelessness, traffic and noise pollution, and pest control). If confirmed in future studies, these findings supply a useful guide for official communication solutions regarding the environment and health in vulnerable communities.

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## Appendix A—Focus Group Moderator Guide

*Hi everyone. Thanks for coming to speak with us. The Massachusetts Department of Public Health and Dana-Farber Cancer Institute are conducting this study to learn more about your opinions about the environment and health.*

*I want to be sure you understand that your being a part of this group is voluntary. You may leave at any time you wish. There will be no penalty or punishment for your doing so.*

I'd like to start off by introducing myself. I'm Josh Gagne and this is Kalahn Taylor-Clark. I'll be leading the group and Kalahn will be assisting with recording and note taking during the discussion. As was mentioned to you when you first heard about this discussion, we will tape record this session. We are doing this because we want to make sure that we remember everything that you say. Your comments are really important to us.

Everything that you say is private and will not be shared with anyone other than the research staff. Please remember that information shared during these discussions should not leave this room.

I want to encourage you to speak openly about your ideas. The goal of this group meeting is not to reach agreement on anything, but to hear as many different views as possible so that we have a good understanding of the different ways people think about the communication services they use. This might be a different experience for you—unlike a training where you listen to the speaker, we're here to learn from you!

Now we'd like everyone to get to know each other a little bit.

Ice Breaker (*Go around the room*)

Could we begin by each of you telling us your first name, how long you have lived in the area, and the thing you like to do the most when you have free time?

OK great—now I will start with the first question.



## SECTION I: Information Seeking and Trusted Sources on Health in General (About 30 minutes)

*We are interested in how you learn about health and environmental issues in general, and whom you trust as sources of information.*

- When you want to know something, where do you usually go for information? (i.e. television, Internet, radio, other?) Does it depend on the topic?
- How do you typically learn about health/health issues?

### *Active Search for Information*

- Have you ever actively look for health information?
  - What did you look for? Why?
  - Where did you look?
  - Or is it something you come across when you are reading the paper or watching TV or listening to radio? (**Does it depend on the type of health situation (i.e. if you or your family member is experiencing a health concern or if someone you know is having specific problems with their health?)**)
- What are some problems you have faced when searching for information?
- Once you found information, did you find the information easy to understand? Did it clarify the questions that you had? Or was it difficult to understand?
- We are curious to know what you thought of the *quality* of information you got. Did you trust the information?
  - When you get the information from this source, what do you do with it?  
→ Do you check with someone else, family/friend, doctor?
  - How do you decide what is a 'good quality' source of information? (For example: if searching on the Internet how do you decide which Internet sites are providing quality information and which are providing poor quality information?)

### *Trusted Source of Information*

- Who do you think is the *most trustworthy* person to give you information about health in general? Why do you trust that source?
  - (If doctor), besides your doctor, whom do you trust most when getting information?
- Suppose we were to provide you information on health –in what form would you like to receive it?
  - Would you like it in the form of experiences of someone like you?
  - Do you just want the facts?
  - Do you like it in the form of stories?



- Do you prefer messages that are emotional in tone?
- In what language do you prefer to read information? In what language do you prefer to hear information?
- Next, we are interested in channels through which you like to get health information.
  - Where would you like to get your information from? (doctor, the Internet, TV, radio, newspapers, magazines, brochures, friends and family)  
→ *If Internet or Radio or Newspaper, what websites/stations/newspapers do you most frequently visit/listen to/read to get this type of information?*
  - What is your most preferred source?
  - Are you ever unsure about the best place to go for information?

## **SECTION II: Risk Perceptions and information seeking on the environment and health (About 45 minutes)**

We are next interested in how you learn about environment and how it affects one's health.

### ***Risk Perceptions***

- When you hear the word 'environment' what does that mean to you?
- Do you think the environment is important to one's health? How so?
- What are the likely diseases one can get in case of a poor environment?
  - Of the diseases that were mentioned, what do you think is the biggest threat to you or your family? What about communities in Massachusetts generally?
  - Do you ever worry about getting a health problem in the future because of a bad environment? What kind of illness are you most worried about? Why?
- Do you think some of the diseases that are caused by a bad environment affect different communities in Massachusetts differently? (We are trying to get at environmental racism, classism, discrimination here)
- I am going to read a list of things that might be a problem in some of your communities. Can you tell me if any of these are a problem in your community in particular? Why do you think it is a problem? (Those in bold are of particular interest here)
  - a. **Air pollution**
  - b. **Unclean water supply**
  - c. Inadequate garbage pickup and poor sanitation
  - d. **Inadequate housing conditions** (such as asbestos and lead contamination)
  - e. **Pesticide spraying**
  - f. Inadequate parks and recreational facilities
  - g. Poor quality of health care services

### ***Information Seeking and Trusted Sources on the Environment and Health***

- If you wanted to know more about environment and health, where would you look? Have you ever looked for info on how the environment affects health?
- What about sources of information on *how the environment* affects health? Is there anyone in particular that you would trust to give you that information? Why do you trust that source (if different from previous)?

### **SECTION III. Attribution of Responsibility**

**(About 15 minutes)**

- Who do you think should be mostly responsible for ensuring that people do not get health problems because of a poor environment?

**END**

That is the end of the session. Thank you for your participation in this focus group. Are there any questions before we wrap-up?

### **Notes**

1. Viswanath K, Emmons KM. Message effects and social determinants of health: its application to cancer disparities. *Journal of Communication*. 2006 Aug;56(1 Suppl): S238–64.
2. Entman RM. Framing: toward clarification of a fractured paradigm. *Journal of Communication*. 1993 Dec;43(4):51–8.
3. Brulle RJ, Pellow DN. Environmental justice: human health and environmental inequalities. *Annu Rev Public Health*. 2006 Aug 9;27:103–24.
4. Bullard RD. *Unequal protection: environmental justice and communities of color*. San Francisco: Sierra Club Books, 1997.
5. Faber DR, Krieg E. *Unequal exposure to ecological hazards: environmental injustices in the Commonwealth of Massachusetts*. Boston: Northeastern University, 2001.
6. Pinderhughes R. The impact of race on environmental quality: an empirical and theoretical discussion. *Sociological Perspectives*. 1996 Summer;39(2):231–48.
7. Walker B, Figs LW, Zahm SH. Differences in cancer incidence, mortality, and survival between African Americans and whites. *Environ Health Perspect*. 1995 Nov;103 Suppl 8:275–81.
8. Gee GC, Payne-Sturges DC. Environmental health disparities: a framework integrating psychosocial and environmental concepts. *Environ Health Perspect*. 2004 Dec; 112(17):1645–53.
9. Newell P. Race, class and the global politics of environmental inequality. *Global Environmental Politics*. 2005 Aug;5(3):70–94.
10. Mohai P, Bryant B. Is there a “race” effect on concern for environmental quality? *Public Opin Q*. 1998 Winter;62(4):475–505.
11. Hershey MR, Hill DB. Is pollution ‘a white thing’? Racial differences in pre-adults attitudes. *Public Opin Q*. 1977–1978 Winter;41(4):439–58.
12. Greenberg M. Is public support for environmental protection decreasing? An analysis of U.S. and New Jersey data. *Environ Health Perspect*. 2004 Feb;112(2):121–5.
13. Adeola FO. Environmentalism and risk perception: empirical analysis of Black and

- White differentials or convergence. *Society & Natural Resources*. 2004 Nov-Dec; 17(10):911-39.
14. Evans DT, Fullilove MT, Green L, et al. Awareness of environmental risks and protective actions among minority women in Northern Manhattan. *Environ Health Perspect*. 2002 Apr;110 Suppl 2:271-5.
  15. Greenberg MR. Concern about environmental pollution: how much difference do race and ethnicity make? A New Jersey case study. *Environ Health Perspect*. 2005 Apr;113(4):369-74.
  16. Perry RW, Lindell MK, Greene MR. Crisis communication: ethnic differentials in interpreting and acting on disaster warnings. *Soc Behav Pers*. 1982;10(1):97-104.
  17. Viswanath K. Society and science: the communications revolution and cancer control. *Nat Rev Cancer*. 2005 Oct;5(10):828-35.
  18. DiMaggio P, Hargittai E. From the 'digital divide' to 'digital inequality': studying internet use as penetration increases. Princeton, NJ: Princeton University, 2001.
  19. DiMaggio P, Hargittai E, Neuman WR, et al. Social implications of the internet. *Annu Rev Sociol*. 2001;27:307-36.
  20. Ramanadhan S, Viswanath K. Health and the information non-seeker: a profile. *Health Commun*. 2006;20(2):131-9.
  21. Viswanath K. Public communications and its role in reducing and eliminating health disparities. In: Thomson GE, Mitchell F, Williams MB, eds. *Examining the health disparities research plan of the National Institutes of Health: unfinished business*. Washington, DC: Institute of Medicine, 2006; 215-53.
  22. Viswanath K, Lee KK. Ethnic media. In: Waters MC, Ueda R, eds. *The new Americans: a guide to immigration since 1965*. Cambridge, MA: Harvard University Press, 2007.
  23. Clayman M, Viswanath K, Arora N. Differences in mass media source credibility ratings for cancer information among Spanish responding and English responding Hispanics. Washington, DC: American Public Health Association, 2004.
  24. Loh P, Sugarman-Brozán J. Environmental justice organizing for environmental health: case study on asthma and diesel exhaust in Roxbury, Massachusetts. *Annals of the American Academy of Political and Social Science*. 2002 Nov;584(1):110-24.
  25. Randolph W, Viswanath K. Lessons learned from public health mass media campaigns: marketing health in a crowded media environment. *Annu Rev Public Health*. 2004;25:419-37.
  26. Hornik R. Public health communication: making sense of contradictory evidence. In: Hornik R, ed. *Public health communication: evidence for behavior change*. Mahwah, NJ: Lawrence Earlbaum Assoc., 2002.
  27. Gaziano C. The knowledge gap: an analytical review of media effects. *Communic Res*. 1983;10(4):447-86.
  28. Viswanath K, Finnegan JR. The knowledge gap hypothesis: twenty five years later. In: Burleson BR, ed. *Communication Yearbook 19*. Thousand Oaks, CA: Sage Publications, 1996; 187-227.
  29. Kreuter MW, McClure SM. The role of culture in health communication. *Ann Rev Public Health*. 2004;25:439-55.
  30. West DM, Miller EA. The digital divide in public e-health: barriers to accessibility and privacy in state health department websites. *J Health Care Poor Underserved*. 2006 Aug;17(3):652-66.
  31. Bandura A. Social cognitive theory in mass communication. In: Bryant J, Zillman D,

- eds. *Media effects: advances in theory and research*. Hillsdale, NJ: Lawrence Earlbaum Assoc., 2002.
32. Green MC. Narratives and cancer communication. *Journal of Communication*. 2006 Aug;56(Suppl 1):S163–83.
  33. Campbell MK, Quintiliani L. Tailored interventions in public health: where does tailoring fit in interventions to reduce health disparities? *Am Behav Sci*. 2006;49(6): 779–93.
  34. Kreuter MW, Farrell DW, Olevitch LR, et al., eds. *Tailoring health messages: customizing communication with computer technology*. Mahwah, NJ: Lawrence Erlbaum Assoc., 2000.
  35. Rimer BK, Orleans CT, Fleisher L, et al. Does tailoring matter? The impact of a tailored guide on ratings and short-term smoking-related outcomes for older smokers. *Health Educ Res*. 1994 Mar;9(1):69–84.
  36. Covello VT. Best practices in public health risk and crisis communication. *J Health Commun*. 2003;8 Suppl 1:5–8.
  37. Sandman PM. *Risk = hazard + outrage: a formula for effective risk communication*. Akron, OH: American Industrial Hygiene Association, 1991.
  38. Slovic P. Perceptions of risk. *Science*. 1987 Apr 17;236 (4799):280–5.