People, Polar Bears, and the Potato Salad

Mapping the Gaps Between Expert and Public Understandings of Environmental Health

A FRAMEWORKS RESEARCH REPORT

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The FrameWorks Institute is an independent nonprofit organization founded in 1999 to advance science-based communications research and practice. The Institute conducts original, multi-method research to identify the communications strategies that will advance public understanding of social problems and improve public support for remedial policies.

The Institute's work also includes teaching the nonprofit sector how to apply these science based communications strategies in their work for social change. The Institute publishes its research and recommendations, as well as toolkits and other products for the nonprofit sector, at www.frameworksinstitute.org.

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INTRODUCTION

The research presented in this report was conducted by the FrameWorks Institute for the American Public Health Association (APHA), the Association of Public Health Laboratories (APHL) and the Association of State and Territorial Health Officials (ASTHO) with funding from the CDC's National Center for Environmental Health (NCEH). This report is the first step in a larger project in which FrameWorks will develop specific communications tools for the field of environmental health. This research is designed to help those who work in environmental health policy, practice, research, and advocacy speak with a more consistent and strategic voice to both public and policy audiences about their field and its work. The goal of the communications project is to build the social and political will required to support efforts to reduce harm associated with environmental hazards, and to help build a strong and enduring infrastructure for environmental health communication.

This report represents the first steps toward that goal by examining how experts and the general public understand the topics of environmental health. We compare these expert and public understandings to "map the gaps" that exist between experts and members of the general public, and to identify specific areas where communications can bridge those gaps by cultivating new ways of understanding. Giving members of the public access to the ways that experts think about environmental health issues is a key aspect of reframing the public discussion and building support for environmental health efforts, institutions and policies.

The "mapping the gaps" exercise is divided into three discrete research phases that serve as the organizational structure of this report. We first explore and synthesize the sometimes incongruent expert discourse on environmental health, examining the substance of what professionals in this field are discussing, as well as the more implicit patterns that underlie how they explain their work and its importance.

The second part of this inquiry involves assessing how the public understands these same issues. This part of the analysis seeks to uncover the "cultural models" that members of the general public access when they think and talk about environmental health and the issues they relate to this construct. In a series of "cultural models interviews" conducted with ordinary (but civically engaged) members of the public, FrameWorks aims to discover how Americans understand general concepts about environmental health.[1] To explore how people think about these issues, we adopt a cognitive approach and focus on the shared underlying assumptions and understandings that structure conversation around these issues.

As the third and final part of this initial phase of our larger research project, we compare the expert and public interviews, "mapping" – or exploring the similarities and differences between – the ideas that the experts discussed in relation to how

the public understood these ideas. FrameWorks is especially interested in identifying gaps in understanding that, if filled with clarifying information, hold promise for improving the public's understanding of the environmental health field. Finally, we identify a range of key reframing strategies that could be tested in prescriptive reframing research as ways to bridge the gaps between expert knowledge and public perception.

SUMMARY OF FINDINGS

The Expert View

Experts agreed that the work of environmental health is to assure the conditions of human health and provide healthy environments for people to live, work, and play. This work is accomplished through *risk assessment*, *prevention*, and *intervention* efforts aimed at reducing or eliminating contaminant and contagion threats to human health due to air, water, food, soil, vector, and animal exposures, and *health promotion* efforts that address systemic factors and seek to construct wellness-friendly environments at the population level. This mission engages environmental impacts from local to global scales, and depends upon publicly funded research, communications, surveillance, epidemiology, subject matter expertise, and policy efforts that address the full scope of environmental impacts on health. Experts recognized many challenges facing the field, including a dispersed organizational structure and powerful political opponents, and called for a renewed commitment to coordinate efforts among the field's many stakeholders. They also emphasized the need to engage communities and to strengthen communication and dissemination practices in the effort to shape public and policy discourses on environmental health. Many argued that the field must refocus its efforts on policy, and develop a more coherent academic and professional structure to train a new, multi-disciplinary generation of environmental health professionals.

Cultural Models Interviews

Interviews revealed that the public has a dominant model for thinking about environmental health *threats* and a very weak, fragmented model for thinking about environmental health *work*. This critical distinction structures patterns of public thinking across each of the following areas:

Importance: Members of the public have an active concern about environmental health *threats*, and especially about the safety of food, water, air, and their domestic environments. Their concerns are derived from a range of sources, including personal and family illnesses (asthma, cancer, and other conditions) and popular media stories about environmental health impacts. The public does not, however, have an active model of the importance of environmental health *work*, and are largely unable to identify or describe many of the institutions and practices of

environmental health that are in place on their behalf. Yet, once engaged in a discussion of environmental health threats and what can be done about them, public informants spoke to *the criticalness of basic environmental health functions*, like sanitation, air and water quality, and food safety work. Once pulled into active thinking, these taken-for-granted functions shifted from absent to very important. Embedded within these statements – and the transition from absent to important – was a core model that affirmed the goodness of health and the basic principle that everyone deserves to live in a healthy environment.

Definition: The phrase "environmental health" is not a familiar one to most members of the public, even as most were able to correctly state or guess at its meaning. This lack of familiarity with the phrase did not represent a lack of thinking about environmental health *threats*, but did correspond with a lack of thinking about environmental health *work*. On the topic of environmental health threats, public thinking was dominated by concerns about exposure to contaminants – chemicals, particulates, artificial hormones and steroids, heavy metals, pollen, and the like. This *contaminant model* of environmental health threats dominated thinking and served to structure the overall understanding of environmental impacts on health. The strength of the model likely served to constrain thinking about other environmental features and facets that might also affect health, such as the built environment, habits of movement, patterns of energy use, and access to health resources. There was no corresponding dominant model of environmental health *work* and the public defaulted to the more familiar arenas of environmentalism and health care.

Organization: Informants were familiar with the sectors of air and water quality, sanitation, and food safety, and, when asked, were able to speak about threats of contaminant exposure in these areas. When primed, they were able to articulate basic knowledge about prevention efforts in the area of sanitation ("garbage men" and dumps) and food safety (hairnets and inspectors). They were much less familiar with the arenas of chemical and radiation exposure. Unpracticed in thinking about the contours and scope of environmental health work overall, members of the public struggled to identify the key agencies, institutions, hierarchies, professions, and skill sets of the field.

Responsibility: In discussing issues related to environmental health work, informants articulated *a distributed model of responsibility*, locating responsibility with (1) government, (2) businesses, and (3) individuals. Woven throughout this three-part model was a recurrent individualization of that responsibility through a focus on preventative measures at the household level and on "education" efforts to cultivate better decision making by individuals. Nonetheless, there was a consistent and universal assumption of government's responsibility to address environmental health threats that transcend personal control.

Solutions: Informants' discussions of solutions to environmental health issues consistently focused on decisions and measures that can and should be taken *at the personal and household level*. While government was expected to provide reliable information and take protective regulatory action, informants' statements returned consistently to steps individuals must take to increase their awareness and improve their decision making. Beyond these individual-level solutions, informants generally described broader and more diffuse solutions, including calls for local empowerment, more social connectedness (neighborliness), reduced patterns of consumption and expansion, and an idealized notion of local production.

Recessive Models: In addition to the dominant contaminant model, informants employed a series of more latent, or "recessive," assumptions about environmental health impacts. These models were less pervasive, less "top of mind," and less well formed and articulated. For our informants, they included an understanding that *social relationships*, *economic conditions,* and *the organization of built environments* can have profound health effects. These models represent promising targets for future communications efforts that seek to expand public thinking about environmental health.

Mapping the Gaps
There are two substantial disconnects *within default patterns of public thinking* about environmental health. The first disconnect is between how the public typically thinks about environmental health threats (dangerous and important) and how they typically avoid and *do not* think about environmental health work (largely taken for granted). The second disconnect is between this largely absent pattern of thinking about environmental health work and an activated pattern of thinking that allows people to make sense of this work. These disconnects defined the contours of how public thinking both overlapped with and diverged from expert knowledge.

> ***Public Disconnect #1***
> Environmental health threats are important.
> Environmental health work is *not* important.
>
> ***Public Disconnect #2***
> Environmental health work is *not* important.
> Now that I think about it, environmental health work *is* important.

Expert-Public Overlaps: Once their thinking was activated through questioning from the interviewer, the public spoke about environmental health work in ways consistent with expert positions, asserting that preventative, proactive approaches to environmental health threats are ideal and should be realized whenever possible. Both experts and the public also spoke about environmental health efforts with an

implicit assumption that government has a primary role to play in these prevention efforts, including via important functions of regulation, communication, and research. Both experts and public informants also recognized that powerful commercial interests are often not aligned with environmental health efforts and represent a substantial challenge to protecting the public's health from negative "man-made" environmental impacts. Both experts and the public also spoke of the environmental health sector as fragmented, though experts did so directly, while the public did so indirectly through their often faltering efforts to characterize it.

Expert-Public Gaps: Substantial differences were evident in expert and public thinking about both environmental health *impacts* (including threats) and environmental health *work*. While experts demonstrated a consistent awareness of, and commitment to, the importance of environmental health *work*, the public often took this work for granted and failed to consider its ongoing nature and critical importance. While both experts and the public spoke to the importance of material contaminant threats to health, experts recognized and spoke to a broader set of interconnected factors that impact human health, including social, economic, infrastructural and climatic factors. While several of these factors were evident as recessive cultural models among members of the general public, they were minor themes in a larger story focused overwhelmingly on local threats of exposure to toxic contaminants. Only rarely did members of the general public link these local threats to larger systems or events.

While experts were able to draw clear lines between *environmental health* and the *environmentalist movement*, these lines were often blurred for public informants, who shifted between cognitively discrete concerns with human health, on the one hand, and the health of the environment as its own end, on the other. When this happened, default assumptions about environmentalism, including the presumed asceticism and sometimes extremism of the movement, emerged as a distraction. In the same vein, while experts clearly distinguished between environmental health and systems of health care provisioning, public informants tended to conflate the two. The link to "public health" had similarly unproductive effects and invoked references to medical services provided to indigent populations. With this default to thinking about health came a tendency to individualize responsibility for personal health, muting attention to systemic environmental factors.

More broadly, experts consistently looked to public policy and the impact of population-level interventions as the primary *locus of solutions* to environmental health challenges, while members of the public overwhelmingly focused on changing individual behavior as the solution to environmental health challenges.

Communications Implications

Attempts to reframe public understanding of environmental health should deliberately engage available cultural models that are consistent with the expert story. By invigorating and building on accessible and productive patterns of thinking, communications will be able to increase public understanding of this field and the critical importance of its work. At the same time, communications should avoid triggering models that inhibit the public's ability to understand key aspects of the expert story.

At this point, it is clear that the public has a robust model of contaminant threats to human health, but also an equally well-developed pattern of avoiding engagement with the reality of those threats and the work required to address them. As such, the consequences of triggering the "contaminant model" as a communications strategy are as yet unclear. Does the activation of this highly available way of thinking constitute a building block for other ways of thinking about potential relationships between environments and human health? Or is the contaminant model so dominant that it crowds out other ways of thinking, or, worse yet, triggers an avoidance that closes down thinking altogether? The question of the model's utility or liability as a communications tool will be addressed in upcoming prescriptive communications research, in which FrameWorks will empirically test and compare the effectiveness of a variety of communications strategies.

Until further research can be done to address this core challenge, communications should focus on helping the public build a clearer picture of the field and a broader vision of the variety of ways that environments impact human health. At this early stage in the research process, FrameWorks researchers can offer these preliminary communications recommendations:

- **Speak to the field's current and historical successes and affirm the critical nature of the effective, evidence-based work being done.** Communications should connect environmental health work and success to a bigger picture that links causes and consequences. Considering the public's uncertainty about the organization of the environmental health sector, and the extent to which they often take this work for granted, communication efforts will need to validate and offer concrete examples of environmental health impacts and the work that is done to prevent and respond to such impacts.

- **Speak to the "conditions" that shape the "health of populations" to expand public thinking about the relationship between environments and health.** Communications should focus on the *conditions* that *facilitate health*. Such discussion should focus squarely at the population level and in terms that do not allow the public to default to thinking about "health" in highly individualized terms.

- **Be careful of the term "environment."** In a related way, and in light of the tendency to confuse "environmental health" with "environmentalism," communications should maintain a focus on human populations and take care in the use of the term "environment." As noted, strategic use of the language of "conditions" should be explored as an alternative.

- **Employ and build on recessive models.** Communications should build on existing recessive cultural models that include understandings of the connections between human health, on the one hand, and built environments, social relationships, economic conditions and infrastructure, on the other.

- **Develop a coherent picture of the field that does environmental health work.** Communicators need to address the public's sense that there is no coherent field of environmental health. This represents a substantial challenge to the field that extends beyond the scope of communications practice. Efforts should seek to clarify the common mandate of the field and communicate the concrete standards, patterns and structures that are in place. This will help the public understand the institutional parameters of the field and develop a more coherent model of the work that is being done.

- **Focus on prevention and promotion in addition to risk and hazards.** While models of *health as safety* have the capacity to galvanize support for environmental health efforts, a focus on risks and threats can potentially trigger an avoidance pattern in public thinking, one that mutes appreciation and support for both mitigation and health promotion efforts. As such, communications efforts should seek to cultivate a proactive and preventative concept of environmental health that goes beyond definitions of risk.

- **Develop notions of local empowerment.** Despite the lack of a coherent model of environmental health, informants did voice an idealistic hope for local empowerment in shaping environmental health policy. Communications should explore ways of activating this participatory model of an engaged citizenry, while avoiding the "backyard" syndrome that can result from a narrowing of perspective and concern to only one's own community.

- **Be careful of the role attributed to government.** Despite their highly individualized model of health, informant discussions revealed a model of government as protector of the people from forces that are beyond personal control. In the context of a myriad of more critical and cynical models that Americans readily apply to reasoning about government, this more positive assumption is highly promising and should be explored.

The remainder of the report proceeds as follows: We present the methods used in the study, then discuss the findings and implications of both expert interviews and those conducted with civically engaged members of the public. We then discuss the specific gaps that lie between expert and public understandings and conclude with an initial set of recommendations that can be used to open up new avenues of thinking about environmental health and the work of this field.

RESEARCH METHODS

The Expert View

Four research methods were employed to generate a summary of the expert view of environmental health: (1) expert interviews, (2) a literature review, (3) participant observation at a professional conference, and (4) an online webinar with experts from the field.

Expert Interviews

FrameWorks researchers first conducted a series of 10 one-on-one interviews over the telephone with environmental health experts in July and August 2010. The interviews lasted approximately one hour and, with the participants' permission, were recorded and subsequently transcribed for review and analysis. To locate experts, FrameWorks compiled initial lists with help from staff of the American Public Health Association (APHA), the Association of Public Health Laboratories (APHL) and the Association of State and Territorial Health Officials (ASTHO). Individuals on the lists provided by these organizations were asked for additional recommendations for interviewees. Given the wide range of professionals studying and working in this field, the final list sought to include as many different "types" of environmental health practitioners as possible, including both academics and applied practitioners, and experts on various aspects of the field of environmental health. Expert interviews consisted of a series of probing questions designed to capture the expert understanding of the environmental health field and its core principles, parameters and challenges. In doing so, the interviewer went through a series of prompts and hypothetical scenarios designed to challenge expert informants to explain their research and experience, break down complicated relationships, and simplify concepts and findings from the field.[2] Analysis employed a basic grounded theory approach.[3] Common themes were pulled from each interview and categorized, and negative cases were incorporated into the overall findings within each category, resulting in a refined set of themes that synthesized the substance of the interview data. The analysis of this set of interviews resulted in the drafting of an initial summary of expert perspectives on the field of environmental health.

A Literature Review
The second research method employed was a comprehensive academic literature review designed to identify the main themes that undergird the scientific discourse on environmental health. The focus of the review was on the ways experts commonly define environmental health and conceptualize issues and problems related to the field. The sample of articles included in the literature review was drawn from PubMed — an online resource that provides access to over 20 million citations from biomedical and life science journals, as well as a large collection of online books. The search strategy was designed to capture articles that dealt with issues that were firmly within in the field of environmental health and that contained some broader discussion of the field's history, current status or future.

An initial search was conducted using the terms "environmental + health." To arrive at a manageable sample, but one that included both the breadth and depth of the field, only review articles published between 2008 and 2011 that contained explicit discussion of the status of the field of environmental health were included. A second search, using the terms "environmental + public health," yielded a smaller number of articles and, as such, all results from this second search were included in the final sample.

After taking these various considerations into account, the final sample included 85 articles. Analysis of these articles was conducted using a grounded theory approach[4] in order to establish the primary and recurring themes in the literature as a whole. As such, the themes identified were representative of all the articles included in the sample and thus can be seen to characterize the published materials in the field. As the analysis was conducted, the themes were revised and refined to reflect the inherent tensions in the field.

Participant Observation at Professional Conference
A senior FrameWorks anthropologist also attended a gathering of environmental health experts at a March 2011 conference organized by the Public Health Accreditation Board (PHAB). This was the second meeting of the Environmental Public Health Think Tank and was organized to review and assess a beta test run by PHAB of the environmental health component of the accreditation process for state, local and tribal health departments. The conference discussions included feedback on matters of process, as well as the proposed domains and standards of accreditation themselves. Discussion at the meeting provided insights into the definitional parameters of the field as it relates to the broader public health sector and the diverse ways that states, tribes and localities integrate environmental health concerns into their public health efforts and offices. The attending FrameWorks researcher took notes throughout the conference, conversed with and asked questions of participants, and solicited supporting materials (copies of PowerPoint presentations, minutes, etc.) from PHAB in the days that followed the conference.

Webinar

FrameWorks hosted an online webinar in early May 2011 that brought together 14 experts in environmental health. These experts were drawn from a list of leaders of the field provided by APHA, APHL and ASTHO. These leaders represented both the academic and more applied aspects of the field. The two-hour webinar took the participants through two exercises. The first was a structured Q&A session addressing a set of questions developed by FrameWorks researchers about the field of environmental health. The second exercise addressed the primary goal of the webinar — to solicit response and critique from the assembled experts to the initial summary of the expert view of the field derived from the first round of expert interviews described above. In response to a bullet-point summary of the key messages of the field, experts were asked to suggest additions, deletions, amendments, and refinements, and to provide rationales for why these messages are important to communicate to the public. Following the webinar, the participating experts were asked to provide additional feedback and commentary in written form.

What we present below is the refined set of themes that emerged from the analysis of the data gathered from the four-part research strategy. Together, these themes represent the key messages about the field of environmental health that experts wish to communicate to the public. These themes represent the messages to be communicated to the public, and establish a baseline understanding relative to which subsequent communication recommendations are evaluated as part of the larger effort to improve public understandings about environmental health.

Cultural Models Interviews

To complete the other side of the comparison, we conducted interviews with members of the American general public. The findings presented below are based on twenty-one in-depth cultural models interviews with members of the public in Dallas, Texas; South Bend, Indiana; Boulder, Colorado; and Cleveland, Ohio. The interviews were conducted by three FrameWorks Institute researchers in May and June 2010.

Informants were recruited by a professional marketing firm through a screening process developed and employed in past FrameWorks research. Informants were selected to represent variation along the domains of ethnicity, gender, age, educational background and political ideology (as self-reported during the screening process). Individuals working in fields related to environmental health were screened out of the sample. Inclusion of such professionals would have brought expert knowledge into our sample and impeded our ability to gather data about how the general public reasons about target concepts.

We were careful to recruit a sample of civically engaged persons for this project in order to increase the likelihood that our informants could speak to the issues at

hand with some degree of knowledge and opinion. Because cultural models interviews rely on our ability to see patterns of thinking – the expression of models in mind – through talk, it is important to recruit informants who are more likely to actually talk about the issues in question, but who are not experts or practitioners in the field. Moreover, to help ensure that participants were likely to have ready opinions about these issues without having to be primed by asking them directly about the target issue[5] – in this case, environmental health – the screening procedure was designed to select informants who reported a strong interest in news and current events, and an active involvement in their communities through participation in community and civic engagements.

At this stage of the research and at this level of analysis, we are not concerned to address the particular nuances in the cultural models across different groups, even as we recognize the importance of questions of variation and representativeness of these findings. We take up these interests in subsequent quantitative phases of this project where research methods are more appropriate to answering these questions.

Efforts were made to recruit a broad range of informants in terms of age, political identity, and level of education. All in all, twelve women were recruited, and nine men. Thirteen of the twenty-one participants were Caucasian, four were African American, and four were Hispanic. Six participants self-identified as "conservative," five as "liberal," and the remaining ten as "middle-of-the-road." The mean age of the sample was 47 years old, with an age range from the late 20s to the late 60s. We must note here that although the sample was constructed to include as much variation as possible, it is not nor was it meant to be nationally representative in any statistical way. Issues of demographic variability and representativeness of the findings presented here are taken up in a subsequent phase of FrameWorks' research. In this later method, such questions can be more appropriately and effectively addressed in a large sample size, via online experiments where more rigorous statistical sampling techniques are possible.

Informants participated in one-on-one, semi-structured "cultural models interviews" lasting one to two hours. Consistent with interview methods employed in psychological anthropology,[6] cultural models interviews are designed to elicit ways of thinking and talking about issues – in this case, ideas about what constitutes environmental health, who does it and what their work involves, and what challenges and threats are primary, among other topics. All interviews were recorded and transcribed. Quotes are provided in the report to illustrate major points, but any information that would identify the specific individual informant has been excluded to ensure anonymity.

Elements of social discourse analysis, cultural models analysis and grounded theory were applied to identify larger, shared cultural models.[7] First, patterns of *discourse,* or common, standardized ways of talking, were identified across the sample using a basic grounded theory approach to thematic analysis. These discourses were then analyzed to reveal tacit organizational assumptions, relationships, propositions and connections that were commonly made but taken for granted throughout an individual's transcript and across the sample. In short, our analysis looked at patterns both in what *was* said (how things were related, explained and understood) as well as what was *not* said (shared, but taken-for-granted assumptions). More detailed information about the specific methodology and format of these interviews can be found in Appendix 1 at the conclusion of this report.

THE EXPERT VIEW

Below is a list of the main themes that emerged from our literature review and research with experts.

1. Environmental health looks at human-environment interactions and addresses conditions of health. The field consistently defines itself via the effort to assure environmental conditions in which communities can be healthy. This mandate involves efforts to anticipate problems, investigate and understand potential associations between environmental exposures and health outcomes, develop interventions to reduce the risks of negative exposures, construct "wellness-friendly" infrastructures that minimize risk and maximize quality of life, and sustain and promote the ecological balances and environmental qualities that are essential to long-term population health. Two strong and parallel emphases run through this vision of human-environment interactions.

- **Risk Management.** Environmental health work is organized around a focus on those aspects of the natural and modified environment that contribute to the emergence of disease, injury, and death in humans. Central to this work are risk assessment, prevention and intervention efforts aimed at reducing or eliminating contaminant and contagion threats to human health due to air, water, soil, food, vector, and animal exposures. This focus on material hazards and their vectors remains in many respects the "front line" of environmental health work. This focus depends on critical surveillance and evaluation efforts to determine safe levels and conditions of exposure, standards meant to inform those regulations established to protect public health. Much of the environmental health literature to date has focused on this foundational risk assessment and intervention work.

- **Health Promotion.** Environmental health has been part-and-parcel of the field of *public health* since its formal inception in the United States in the late nineteenth century.[8] This emphasis on health promotion is directed at addressing larger-scale systemic and policy factors that shape environmental health conditions. These include attention to public infrastructures, the design of healthy built environments, patterns of energy use, the impacts of economic disparities, local community awareness and engagement, and other social and population-level determinants that shape environments at both a local and global scale in ways that affect human health. The focus here is on *health promotion* rather than *disease prevention* — on "moving upstream" as far as possible to create environmental conditions that promote positive human health across the full spectrum of individual, community, national and global life. An emergent concern with climate change and its implications for population health is part of this macro-oriented emphasis.

Those who work, teach and advocate in the field of environmental health recognize that these emphases are two sides of the same coin. Whether viewed from the perspective of risk management or health promotion, environmental health work is, at its core, about shaping, building and sustaining environmental conditions that are conducive to population health for current and future generations. That is the central challenge and mission of environmental health.

2. Public policies affect the human-environment interaction. Experts asserted that the field should focus greater attention on the policy arena, especially in light of American health, rising health care costs, the "silver tsunami" of an aging population, and global climate trends. As one expert put it, we are "in for a perfect storm of environmental, social, and economic issues that are going to profoundly affect our health." The fullest realization of this vision would be for all major government legislation, along with other substantial infrastructure projects and industrial activities within the private sector, to consider health outcomes through tools like health impact assessments.

3. *Public* environmental health agencies are central to the tasks at hand. Even as many kinds of institutions engage in environmental health work, including those within academic, nonprofit and commercial sectors, experts emphasized that governmental agencies and personnel play a necessarily central role in building and maintaining healthy environments for Americans. As such, experts explained that government must be empowered at all levels (federal, state, local, and tribal) with the tools (legal, technological, staffing, etc.) necessary to do environmental health work.

4. Environmental health has many institutional homes. There was a broad consensus among experts that the field of environmental health lacks a defining

identity, the result, at least in part, of a dispersed public organizational structure. Historically, the field of public health grew out of environmental health concerns, like managing waste and trying to provide the public with safe food and drinking water. Much public health work remains rooted in that effort to address health issues resultant from environmental factors. In that vein, experts agreed that environmental health and public health represent different emphases within a common endeavor — creating "healthy communities for healthy people." Yet, both experts and the literature also noted that, in the final third of the 20th century, the field of environmental health became increasingly associated with efforts to define and regulate safe levels of pollution and toxicity, and that, as a result, many environmental health responsibilities became housed outside of departments of public health. The creation of the federal Environmental Protection Agency in 1970 is one key example of this trend. In the 21st century, environmental health and public health seem to be merging around a common focus on prevention.

Three central arenas of challenge emerge from the field's dispersed organizational structure:

- **Responsibility:** At the federal level, important environmental health work is done in multiple government agencies — including the Department of Health and Human Services (DHHS), the Environmental Protection Agency (EPA), the United States Department of Agriculture (USDA), the Food and Drug Administration (FDA), and the Department of Homeland Security (DHS). At the state, local and tribal levels, environmental health functions are located in various departments, including those of health, environment, human services, public safety, agriculture, and mental hygiene. While some advantages to this distributed institutional landscape were acknowledged, most notably the broad reach of environmental health knowledge and thinking into multiple professional arenas and domains of work, many experts spoke to the challenges and disadvantages of this, as one expert called it, "patchwork of responsibilities."

- **Identity:** Today, the field is wrestling with how to construct a common identity for itself, as a means to both integrate efforts across its multiple institutional homes *and* present a coherent identity and mandate to both policymakers and the public. Some are arguing for a renaming of the field as "Environmental Public Health" in order to highlight the field's people-centered focus, help avoid confusion with environmentalism, and situate the field more firmly in the well-established public health sector. Others argue for retaining the historical "Environmental Health" name, hoping to maintain the field's distinctive identity and avoid what is seen as the public's tendency to negatively associate "public health" with bureaucratic health care provision for indigent populations. This naming division within the field represents a key challenge to efforts to construct

a common identity and unified front for engagement with both policymakers and members of the public.

- **Coordination:** Amid the naming controversy, experts and the literature spoke consistently to the need for enhanced coordination amongst the field's multiple stakeholders via networks like the Environmental Public Health Tracking (EPHT) program, which facilitates the collection, integration, analysis, interpretation and dissemination of health and environmental data on local, state and national levels. Movements towards standardization, as evidenced by the CDC's Environmental Public Health Performance Standards and the Public Health Accreditation Board's (PHAB) accreditation process, are generally deemed positive developments, as are efforts to lower redundancies across agencies and departments at all levels of government. Experts also spoke to the importance of enhanced IT interoperability across agencies and programs to facilitate the fluid movement of information and data and provide for larger and more integrated systems-level analyses.

5. Community engagement and communications are critically important to the work of environmental health. Experts recognized that there is a robust discourse in America that is critical of government in terms of both efficiency and integrity, including an assumption that government is compromised by big business. As such, they recognized the challenge of cultivating faith in public environmental health efforts and pointed to the importance of communications and community engagement strategies as key mechanisms to build that faith. Experts argued that the field should use communication and dissemination as tools to bring diverse stakeholders, including both policymakers and the general public, to a common understanding of the issues at stake. Risk communication, in particular, was deemed critical, as was providing forums for public deliberation about risk factors and the challenging work that is being done to mitigate those risks and protect members of the public.

- **Demonstrating Results:** Experts recognized that environmental health communications efforts are often constrained by political pressures, and that the complexities and goals of scientific communications are not always faithfully reproduced in subsequent media coverage. Nonetheless, they agreed that communicating about effective environmental health efforts is critical to building public support, and that the science demonstrating environmental impacts on conditions like cancer, diabetes, obesity, infectious disease, injury, and mental health should be clearly communicated. Recognizing that the science of determining the levels, parameters and outcomes of exposure is notoriously difficult, experts agree that the field needs to develop mechanisms to more effectively evaluate how environmental health work positively impacts community health, in order to communicate these findings to the public.

- **Community Research:** Environmental health scholars pointed to community-based participatory research (CBPR) as another important method for enhancing awareness of, and concern for, environmental exposures, disease prevention and health promotion. CBPR is a collaborative approach that ideally brings together environmental health agencies, nongovernmental organizations, community-based groups, policymakers, researchers, health care providers, educators and members of the local community. These partners all provide input into planning, implementing, translating and disseminating research that addresses local environmental health concerns and topics.
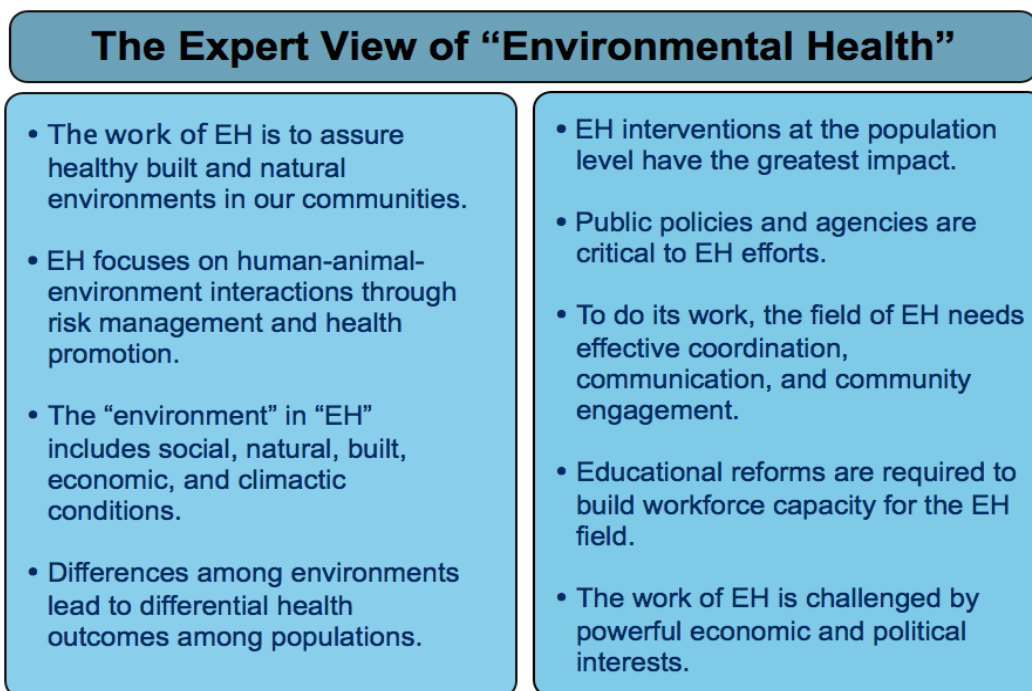
6. The environmental health workforce must be developed in order to fulfill the field's mandate. Environmental health experts were keenly aware of the field's multidisciplinary scope, and its reliance on people working in concert across multiple professions to advance the cause of creating healthy environments for healthy living. Building and supporting a sufficient and robust environmental health workforce across these multiple professions is one of the core challenges for the field as it looks towards the future.

- **Educational Development:** Experts and the literature suggested that the current educational system lacks the capacity to meet future environmental health workforce demands. There is a shortage of accredited undergraduate environmental health programs and these programs can graduate only a fraction of the workforce required to replace retiring professionals and meet projected workforce needs. As interest in both public health and environmental studies increases nationwide, the environmental health community must engage future students and provide appropriate coursework and relevant training opportunities that strengthen links to these fields of study.

- **Professional Definition:** Experts argued that the expansion of the environmental health workforce is constrained by the lack of an established and stable career path. As a result of the diffusion of responsibility among agencies, environmental health professionals often have varying classifications, job titles and personnel categories that are associated with distinct hiring requirements, pay structures and benefits. This lack of consistency is further exacerbated by a general lack of funding, training, recruitment, well-defined leadership and retention in the field. Experts argued that environmental health agencies and organizations must establish clear career paths and provide training and other incentives that will facilitate leadership development and boost retention of skilled professionals.

- **Training Extensions:** Many experts argued for efforts to extend environmental health training into other professional arenas, for example to front-line health

care professionals, who are well positioned to address individuals' vulnerability and exposure to environmental health hazards through assessment and referral, risk communication, and advocacy. At the moment, most health care workers lack education in EH-related issues.

7. **Commercial forces can threaten environmental health.** Experts spoke to the reality that there are powerful commercial forces that are not supportive of objective research or diligent management, monitoring and enforcement of environmental law. These interests are keen to limit EPA's powers and mandates, for example, and to see that state and local health officials lack the resources and power to act on behalf of communities. Many are powerful players on the media landscape, and their efforts have contributed to the politicization of environmental health sciences, on climate change, air, water and soil safety, and other areas of concern. These efforts to obfuscate the science and impact of environmental health work necessitate a skilled and strategic effort to advocate for the field's integral importance to the health of the American people.

Figure 1: The Expert View of Environmental Health

The Expert View of "Environmental Health"

- The work of EH is to assure healthy built and natural environments in our communities.

- EH focuses on human-animal-environment interactions through risk management and health promotion.

- The "environment" in "EH" includes social, natural, built, economic, and climactic conditions.

- Differences among environments lead to differential health outcomes among populations.

- EH interventions at the population level have the greatest impact.

- Public policies and agencies are critical to EH efforts.

- To do its work, the field of EH needs effective coordination, communication, and community engagement.

- Educational reforms are required to build workforce capacity for the EH field.

- The work of EH is challenged by powerful economic and political interests.

FINDINGS FROM CULTURAL MODELS INTERVIEWS

At the center of this research has been the effort to account for the patterned ways that Americans understand the field of environmental health and its relevance to their lives. Throughout the course of our interviews, it became clear that Americans are not accustomed to talking about the *work* of environmental health, even as they are usually familiar with specific instantiations of negative environmental health *impacts*. While language about specific environmental health threats was available, a more general storehouse of concepts, phrases, and terms about the field and its work was either completely lacking or, at best, poorly rehearsed. So, for example, while several informants spoke to the dangers of substances like arsenic or mercury in water supplies, those same informants had difficulty talking about who might be involved in ensuring water safety or what kinds of professional skills might be required to do that work. In short, *Americans have models for thinking about environmental health threats, but they largely lack models for thinking about environmental health as a field of work.* As a result, public informants evidenced difficulty in speaking about the field of environmental health work, and in connecting this everyday work to real and present concerns about environmental impacts on human health. This disconnect presents a challenge for those who seek to cultivate understanding of and support for the institutions and agencies that protect and serve the health and well-being of Americans.

In many respects, this disconnect is not surprising. As one of our expert informants noted, environmental health has historically not been among the categories used in the American educational and cultural system. Americans do not take classes in "environmental health" in grade school or high school. It has not been on the conventional list of college majors. We do not have a Department of Environmental Health in our federal government. As a generalized category for understanding a class of events in the world – those of environmental impacts on human health and the work done to address those impacts – environmental health has been largely absent from our collective conversation. In short, Americans have largely not been exposed to experiences that would have provided a ready-made, prepackaged set of terms, concepts, and narratives through which to speak to the subject of environmental health writ large. At the same time, Americans receive a steady diet of episodic coverage about most health and environmental issues, with little thematic or explanatory coverage.[9] This has the effect of predisposing people to see incidences of environmental threat as disconnected from one another, from public accountability and from possible acts of prevention.[10] The result is that many of our informants struggled to articulate their understanding of *how* environmental factors impact human health and what might be done about them, even as they all had familiarity with such impacts. The result of this gap is that current environmental health communications efforts have a lot of work to do. Amidst this challenging cultural scenario, there are reasons to be encouraged, as

many Americans do understand some of the important ways in which human behavior and health intersects with environmental events, and – once primed – speak to these intersections as important and worthy of attention and resources.

This section of the report discusses findings from the cultural models interviews and is organized into five parts, each of which engages a central theme or topic that emerged from the cultural models interviews:

> **A. Importance**: Why does environmental health matter?
> **B. Definition:** What is environmental health?
> **C. Organization:** Who does environmental health?
> **D. Responsibility:** Who should do environmental health?
> **E. Solutions:** What should be done about environmental health?

For each of these sections, the discussion of research findings will be supplemented with direct quotes from our public informants. These selected quotes are often simply the most direct articulations of what, for many other informants, were less compacted or organized statements, and are intended to represent a larger pattern of talking and thinking about the topics at hand. For many of the cultural models identified, there was no single informant statement that captured the content and contours of the model in question, and so an assembly of quotes is used to capture the larger pattern that was evidenced across the spectrum of interviews.

A. *Importance*: Why does environmental health matter?

Our public informants were actively concerned about a range of environmental health threats and spoke to those concerns directly as important and deserving of attention. In fact, every single informant was able to articulate examples of negative environmental impacts on health at some point during the interview. Topics consistently raised included:

- Heavy metals, like lead, mercury, arsenic, and the threat they pose to children in particular.
- Air pollution, and the extent to which automobile and factory emissions are affecting the air that people breathe.
- Hormones and steroids in meat, and the extent to which they are interfering with people's natural hormone levels.
- Pesticides and the dangers of exposure and potential connection to cancers.
- Chemical additives in food and water.
- Plastics used for food and beverage packaging.
- Workplace safety, including dangers of exposures to particulate matter.

While this list represents only a narrow slice of potential environmental health concerns, it demonstrates that the public is cognizant of environmental health threats and understands them as important. Yet, even as informants were able to identify a range of environmental health threats and speak to their salience, most struggled to identify the agencies, professions, and skill sets that actively work to address these threats. They also tended not to trace these threats back to the factors, systems, or processes that led to the emergence of these threats in the first place. In short, informants displayed a concern about environmental health threats, but lacked an understanding of both the causal chains that generated those threats and the work being done to address them.

Public Disconnect #1
Default model of environmental health threats: *They are important*.
Default model of environmental health work: *It is not important*.

Over the course of a one to two hour interview, our public informants were asked to speak with ever-greater specificity about the field of environmental health and the kinds of efforts that characterize the work being accomplished within it. This process revealed an important secondary pattern – a shift from a largely taken-for-granted model of environmental health work to a model of its importance. To the extent that environmental health efforts are largely assumed and unappreciated, they are not implicitly seen as important. It could be argued that there is an implicit cognitive avoidance process underlying this lack of appreciation for environmental health work. Yet, our research shows that this work can very quickly gain importance once addressed as a topic of conversation or concern. In short, from a cognitive perspective, environmental health work both does not matter (most of the time) and very much does matter.

Public Disconnect #2
Default model of environmental health work: *It is not important.*
Activated model of environmental health work: *It is very important indeed.*

Once informants were engaged in talking about environmental health work, a clear pattern of salience emerged in terms of their modeling of the field and its core concern with human health. Informants universally spoke of health as an inherently good thing and affirmed that everyone – children in particular – deserves the right to live in a healthy environment. In the majority of interviews, this core assumption was left unstated, even as it implicitly structured and ran through conversations. On occasion, some stated this central assumption directly.

> **Informant:** *Do you want anybody to get a parasite in their water? No. Do you want anybody to have brain cancer from radiation? I mean you have to keep the big picture in mind. Do you want someone choking cause they can't*

breathe? Those are the things that you're trying to keep at the end of the tunnel...We can all deal with issues on our own, but if we saw our child with something, nobody wants any one of these things to happen to them.

The same assumption is evident in another informant's discussions of the Gulf oil spill:

Informant: *I'm sure they have their hands full trying to still clean up from Katrina, [and] all the other hurricanes. And now the big oil spill on the Gulf. I'm sure they have their hands full. But I think there should be equal amounts of people going around the country testing air quality, testing water quality, to see how people are living. See, we're entitled to decent air quality. Everyone is entitled to decent water.*

Implications of Salience Models

1. Disconnects hint at communications work to be done. Findings suggest that there are two substantial cognitive disconnects for Americans on the subject of environmental health, both of which have profound implications for thinking about how best to communicate to Americans about the field. While broadly shared public concerns about environmental health threats provide a strong basis for support for environmental health work, the taken-for-grantedness of current efforts suggests that communications must work on showing the public the work being done as well as those areas that remain to be addressed. Communications will need to target the most effective ways to shift public thinking from a default model that takes environmental health work for granted to an activated one that recognizes its fundamental importance and value to society.

2. Potential usefulness of health for all understanding. At a more basic level, the high value placed on human health by the public – and the agreement that people deserve to live in healthy environments – provides a fundamental building block for establishing and expanding support for environmental health efforts on behalf of that public. In contrast to many social issues where entitlement is narrowly debated, environmental health readily commands a large constituency that believes it is a fundamental and shared right. Importantly, restating this "right" may or may not prove advisable in communications, but the fact that it is there as a foundation represents an asset going forward.

B. *Definition*: What is environmental health?

While many of those interviewed, by their own admissions, were not familiar with the phrase "environmental health" itself, fourteen out of the twenty-one people interviewed did point to some form of environmental health *impact* on human health in response to an open-ended question about the meaning of the term "environmental health."

> **Informant:** *How the earth is changing, affecting our health and how we live.*
> ---
>
> **Informant:** *Well I think, perhaps the effects that the environment is having on everyone's personal health; you know, their outcomes.*

Each informant was able to articulate examples of environmental impacts on health at some point during the interview, and several threats were identified repeatedly across the spectrum of interviews:

- Heavy metals.
- Air particulates.
- Hormones and steroids in meat.
- Pesticides.
- Chemical additives in food and water.
- Plastics used in packaging.

While this list represents only a narrow slice of potential environmental health concerns, it provides an instructive introduction to one of the central assumptions that informants employed in understanding what environmental health is: dangerous exposure to "man-made" contaminants.

1. Environmental health is about exposure to dangerous "man-made" chemical contaminants. For those who work in the field of environmental health, this is both a recognizable and predictable model of environmental health impacts, as in fact many of the very real threats facing the public fit this description precisely, from fine particulates in the air to chemical agents under the kitchen sink. What is notable about the dominance of this model among members of the public is the extent to which it so comprehensively dominated and crowded out other ways of thinking and talking about the topic of environmental health.

This assumption relied on four more specific constituent understandings. First, environmental health was consistently understood in negative terms – those of dangers, threats, and risks to human health. Positive models of proactive health maximization and promotion were absent from the interviews, suggesting that these were not associations implicitly connected to the issue.

Secondly, the contaminant model relies on a set of identifiable substances or things – contaminants – that have physical properties that pose a threat to human health. The material locus of these threats provided an anchor point for thinking about environmental health threats and was readily available for reference and articulation. Non-chemical environmental factors – like the organization of space, habits of movements, or patterns of thinking – that also have consequences for health were not present in the interviews.

> **Interviewer:** *What comes to mind if I say the phrase "environmental health"?*
>
> **Informant:** *I think about pesticides that are used on vegetation. We've been given natural fruit, natural vegetables. If we leave it alone, it's very healthy for our bodies. It does not have chemicals in it. Why interject chemicals in something that is natural? And chemicals break down our own natural defense systems. It adversely affects our health. No wonder we have so much cancer coming out and high blood pressure and diabetes at such alarming rates. Because we are tampering with nature, and we shouldn't!*

Third, the contaminant model relies on a conception of *exposure*. It is through contact with dangerous contaminants that humans are subject to threats to their well-being. While informants displayed varying degrees of sensitivity to factors of duration (i.e., short- vs. long-term exposure) and amount (high or low levels), there was a consistent but implicit model of negative contact between people's bodies and things that belong outside of those bodies.

> **Interviewer:** *What comes to mind for you when you hear that term [environmental health]?*
>
> **Informant:** *My body and what's going on inside. When I step outside, what toxins are entering into my body due to all the little things that we do as a community. Do we litter? Do we drive the SUVs? Are people walking outside smoking?*

Fourth, the contaminant model relies on the view that environmental impacts on human health are generated by humans ("man-made"), rather than naturally occurring. Most people had difficulty in articulating natural threats to human health. The one exception was pollen, which was consistently invoked as of natural derivation.

> **Informant:** *The earth is changing, and we are the ones that are changing it, so it is gonna affect our health in some way, shape, form, or fashion.*
> ---

> **Informant:** *Veritably everything we do as humans affects the environment negatively… Literally every action that we take as a modern society has a negative [effect]. There is no such thing as a positive effect on the environment – what we do, in day-to-day living.*

2. Environmental health is about the "environment" and about "health."
Beyond the contaminant model, which was used narrowly but dominantly to think about environmental health *threats,* informants struggled in defining and thinking about a concept of environmental health. Research suggested that, in this struggle, they drew on assumptions they connected to the term's two constituent components – "environment" and health." Furthermore, informants struggled to link up these two constituent terms in consistent and coherent ways throughout the interviews. Instead, a pattern of resorting to more familiar ways of talking about "health" and "environment" as separate topics emerged again and again, and complicated both people's thinking and talking about environmental health. The following quotes point to this compartmentalization of "health" and "environment" as separate cognitive domains:

> **Informant:** *I would assign the name, the term "environmental" to the earth, to the natural elements of the earth…when I hear the word "health," I don't associate the word "health" with the planet.*
> ---
>
> **Informant:** *When I hear "health," I think hospital and, you know, people, health. It's hard to think of health for the environment. So…I had to think a second to get it back to environment. I don't know why health and environment don't quite connect for me. It's a little bit of a stretch.*
> ---
>
> **Informant:** *They seem separate but I can see [that] with even some education, if someone were looking to bring them together you could …But when you just ask about them …in this manner, they feel separate. I mean health is very clear. You have the public and the environmental, and asthma is very prevalent today, especially since I watch the pollen fly around us… And you know that affects the public health and that is also part of the environment, so they could be threaded and woven together. I could totally see that. But I don't think I would do that automatically.*

In many respects, this last quote cuts to the heart of the challenge facing the environmental health sector. The current model is compartmentalized. What is needed is an integrated one.

As much of informant thinking about "environmental health" was structured by assumptions that they drew on to understand the term's constituent concepts – "environment" and "health" – it —is helpful to take a closer look at the cultural models used to make sense of what, for informants, were separate domains.

(a) Models of health. When informants drew on their understandings of health in thinking about environmental health, as they frequently did in our interviews, they relied on three dominant models: health individualism, health as disease, and health as safety.

• **Health individualism.** This model asserts that each person creates his or her own health destiny, and that it is therefore a personal responsibility to make healthy choices. Health benefits and consequences are likewise personalized, with differences in health outcomes being seen as the result of individual choices and actions. When external obstacles are acknowledged, they are viewed as obstacles to be overcome through character and effort.[11]

> **Interviewer:** *When you think about the local environment that you live in, do you have any specific worries about factors in that environment that might be harming your health or the health of people that you care about?*
>
> **Informant:** *No, truly, no, I don't. It goes back to how I feel even about the health. If I'm going to get cancer, I'll get cancer. And most likely it's going to be something I did over the course of my life. I drank too much, or I didn't eat enough broccoli, or I smoked too much, or I didn't exercise enough, whatever. I think that's going to be long term. That's going to affect me more than some pollutants that are out in this environment.*

• **Health as disease.** For many informants, talking about "health" invoked associations with disease, in particular infectious disease. It is interesting to note the extent to which this dominant model crowds out potentially more positive thinking about health promotion.

> **Interviewer:** *If you were to open the newspaper tomorrow and see "environmental health" in the title, and nothing more, what would you think that that story was going to be about?*
>
> **Informant:** *What's in our air. What's in our drinking water, our food. Diseases. Where people live. What are they drinking. Contaminants, the atmosphere.*
>
> **Interviewer:** *When you hear "environmental health," you think of diseases?*

Informant: *About "airborne diseases," coughing, sneezing…the last flu bout that we went through.*

Interviewer: *So how do you think "diseases" relates to that concept of "environmental health"?*

Informant: *Because we really don't know what we're eating. We really don't know what we're drinking. I mean, what's in there? You know, you hear more about, well if you take this, that will help you on that, and then you find out later that the side effect to that is so great. So I always think about: What am I taking, and what am I drinking, and who am I around? How I can I protect myself from these diseases, or airborne pesticides, or stuff?*

To the extent that people associate health with disease, it is perhaps not surprising that discussions of environmental health often invoked references to medicine, hospitals, doctors, and nurses. When asked, "who does environmental health?" the most common responses were the generic categories of "scientist" and "researcher," followed by more specific categories of engineer and biologist. Doctors and nurses, however, were also frequent mentions.

Interviewer: *So who would be the people on a team that does environmental health? What type of people?*

Informant: *Environmental health… I would think would be people that have studied the effects of pollution. I would imagine like engineers, chemical engineers, doctors, researchers, you know, and they could go down to the specific fields of agriculture.*

Interviewer: *And who do you think could be involved in that [Environment Health Group]?*

Informant: *I think it would involve doctors, possibly nurses…*

• **Health as safety.** Informants frequently expressed their understandings of health in terms of safety, displaying an assumption that issues of health are fundamentally issues of safety.

Informant: *Wherever you are, that's your environment. So I'm at work all day long, that's my environment. She's at school all day long, that's her environment until she comes home. And so, when she's there, just as my*

employer is responsible for my health and safety while I'm in that facility, so too is her school principal, and that school district is also responsible for her health and safety.

Interviewer: *So it seems like a lot of what you're talking about is "safety."*

Informant: *I don't know how you pull those apart…how do you pull safety away from health? If I'm injured, am I healthy now? No, I'm not. If I contract a disease because the air you've been pumping into my building is polluted, and now I have emphysema, or lung cancer, am I healthy? Am I safe? I'm now sick, and I'm not safe. So I don't really pull those two [apart]. I put an ampersand in there – it's health & safety.*

(b) Models of environment. When informants drew on their understandings of environments in the course of thinking and talking about environmental health, they invoked two dominant models: (1) environment as local surroundings– such as the home or workplace, and (2) environment on an expansive scale – the environment writ large, as "nature," and associated with trees, animals, vegetation, and the earth. This second model of environments cued thinking about environmentalism.

• **Model of environment as local surroundings.** Informants frequently discussed environmental health through a localized concept of "environment."

Informant: *To me, environment is our surrounding area, the air that we breathe, the community that we live in…the food and the water, the industry, and the type of lifestyle. I think that would all be defined as "environment."*

Informant: *It's hard to describe environment without using the word "environment." I guess, just everything around us. Actually everything around us, including your home, your car, your school, your work. It's all your environment. You know? Just pretty much an area that you work in, and live in, and conduct your life in.*

Informant: *Where you're at, and what you're breathing, what you eat, where you live.*

• **Model of environment as global.** Informants also invoked a more expansive planetary or ecological model, as in the following quotes.

Informant: *I would assign the name, the term "environmental" to the earth, to the natural elements of the earth.*

Interviewer: *What does it mean to do environmental health work?*

Informant: *To me, it could be one side of the coin or the other. It could be that they're really concerned about taking care of the planet, which to me would be a good thing because I think, if you take care of the planet, then you're taking care of the people. But, then again, if it's a kind of organization that's just running after a company out there that's spewing out toxins, uh, I don't know.*

When informants used the more expansive cultural model of environment discussed above, they also tended to veer into the domain of *environmentalism* and assume that discussions of environmental health were about the health of the environment. In response to the initial question of "what is environmental health?" informants frequently offered responses informed by this assumption.

Informant: *[It's] the overall health of the ecosystem.*

Informant: *Obviously the health of the environment…how well people treat the earth*.

This *environmentalist model* represents a strong and recurrent way that the relationship among human activity and the environment is modeled for many Americans. Even those informants who defined "environmental health" as concerned with human health at the outset of the interview drifted back towards an environmentalist model in later parts of the interview. This trending towards what might be called "classic environmentalism" happened again and again, and shows the application and strength of this problematic cultural model in how people think of environmental health. It included romantic associations of a "lost Eden," corrupted by human technology and carelessness, where the impacts are more likely on discrete critters than on people, habitats or ecosystems, as well as references to environmental extremism associated with groups like PETA. Both romantic and extremist associations were transferred into talk about the field of environmental health and those working within it.

The dominance of the environmentalist model is evident in the frequent descriptions of the Gulf oil spill. In these discussions, people's comments focused on birds, fish and ducks and very rarely on humans. When discussions did turn to humans, they focused on economic rather than health impacts.

> **Interviewer:** *So you mentioned coal mines and factories. Any other ways you could think of that people affect the environment that could produce an effect?*
>
> **Informant:** *Well, it's like the oil thing, you know? It affects all of our fish, the birds …things like that. Yeah, and people like that they – I've heard of things being dumped in the ocean, you know, they come up floating to the sea, and get on our beaches.*

While informants were generally able to consider environmental impacts on human health, their conversations were often muddled by the strength of habit of thinking and talking about environment and health as separate domains. One might say that Americans are not practiced in talking about the environment and human health in the same breath.

Explaining the roots of this compartmentalization is beyond the scope of this report, but a hint at part of what is going on is suggested by a predominant trend in the interview transcripts themselves – the tendency for discussions of environmental health impacts to repeatedly trend back toward concerns for the environment for its own sake, apart from concerns for human health. It might be said that environmental health is in some respects the victim of the success of the environmental movement, which has succeeded in focusing public attention on threats to ecosystems and even the biosphere writ large, but often framed primarily in terms of negative impacts on flora and fauna and not on human beings.[12]

Implications of Definitional Models

1. Mixed implications of the contaminant model. The contaminant model provides a ready-made, easily cognized format for understanding an important range of negative environmental impacts on human health. At the same time, because it is so "easy to think," it can constrain thinking about *other* ways that environmental factors affect human health, including via social, economic, infrastructural, and climactic mediums. Even more troubling, it may contribute to a cognitive avoidance pattern of not thinking about contaminant threats or the work that is necessary to address them. As such, until further research can evaluate the effects of activating this dominant model, communicators should proceed with caution in deliberately invoking it.

2. Be aware of cognitive recruitment from the domains of "environment" and "health." The general finding that Americans draw from the domains of "health" and "environment" to make sense of "environmental health" adds considerable complexity to messaging efforts. Communicators need to be aware of the various

models drawn from both domains and carefully navigate the implicit assumptions – both productive and unproductive – embedded in each.

3. Health individualism is unproductive. The health individualism model has straightforward communications implications. Messages on environmental health should avoid activating this dominant model because it obscures systems determinants and population-level impacts.

4. The disease model constrains thinking about health promotion. The cognitive leap from contagion to contaminant is a short one, and it provides a ready-made bridge for thinking about environmental exposures and disease. This cognitive borrowing from the domain of disease exposure brings with it a set of accompaniments that can serve to limit people's thinking about what constitutes "environment" and about what are the mechanisms of positive impact on human health.

5. A safety focus has mixed implications. The *health as safety model* has the capacity to galvanize support for efforts to make environments safer by assessing and managing risk factors. At the same time, a focus on risks and threats has the potential to trigger an avoidance pattern in public thinking, one that mutes appreciation and support for both mitigation and health promotion efforts. As such, communications efforts should seek to cultivate a proactive and preventative modeling of safety that goes beyond definitions of risk.

6. The complexity of two kinds of environments. Messaging efforts need to anticipate and plan whether *local* and/or *global* models of environment will be triggered by their communications, and make adjustments according to their goals. Addressing the topic of climate change, for example, will require a different framing of "environment" than addressing the risks of household cleaning products.

7. The distraction of environmentalism. Many informants defaulted to environmentalist topics while talking about environmental health. This cognitive trend has important implications for communications, as it can act to direct attention away from a concern for human health, as well as trigger other sets of associations (like romanticism and extremism). Communications efforts need to keep the focus on human health, such that attention to the state of an environment is redirected to the health of the population that lives in that environment. References to "the" environment should be avoided, as use of the definite article tends to trigger an environmentalist model.

C. *Organization*: Who does environmental health?

A cognitive hole: The lack of a model of environmental health work. Among the most important findings from this research are two interrelated results that bear significantly upon questions about how best to raise public support for environmental health efforts.

> • Most Americans have only vague ideas about *who* actually does environmental health. While there is notable variation across the different arenas of environmental health work, with some (like food safety) invoking more accurate and detailed descriptions than others (like radiation exposure), there was a widespread and clear dearth of understanding as to the skills, knowledge, and training required to do environmental health work overall.

> • The *environmental health efforts* currently in place are largely taken for granted. Out of sight, they are largely out of mind, assumed and generally under-appreciated.

Over and over again, it became clear that for most of our informants – and presumably for many Americans – the efforts and public structures in place to preserve the environmental health of the American population are taken for granted. This cognitive hole results in a *fragmented model of environmental health work*. For purposes of clarity, this fragmented model can be seen in the ways that informants addressed three questions about the organization of environmental health and the people that comprise this field:

> **(1) What do they do?** One of the indicators of just how taken for granted environmental health work is was evidenced in lack of knowledge about the nature of the work and the skills or methodologies required to accomplish it. When pressed, most informants invoked general categories like "testing," "research," or, at best, "monitoring." Even as most informants could easily articulate the negative consequences if sanitation or food safety measures were not taken, they struggled to articulate an understanding of the work itself, the skills required, or the professions involved.

> **(2) Where do they work?** Members of the public have an even sketchier understanding of the overall organization of the field. While virtually every informant was able to identify some institutional locus for environmental health work – the EPA, FDA, and local health department were the most frequent referents – all struggled to identify and articulate an understanding of how environmental health work is distributed and organized across institutions, levels of government, and professions. The picture that emerges is of a fragmented, patchwork of agencies and people, alongside a faith that, for the most part, what

needs to be done is getting done. Generally, the "who does environmental health?" question was responded to with more general categories, like "government" or "we do" (as taxpayers). When pressed, many resorted to the default category of "scientist" or "researcher."

(3) Who do I trust? Alongside this uncertainty about the personnel, institutional locations, and skills associated with environmental health work was a corresponding confusion about where to look for good, reliable information about environmental health concerns. Several people described the media and informational environment as fragmented and inconsistent.

> **Informant:** *You don't know what to believe. You hear this, you hear that, and you hear different contradictory things. And all the studies that you hear, you know, "Don't eat this" and then three months later, "Oh that's good for you." You know, who's sponsoring these studies? I mean, for instance, the drug manufacturers – a lot of times there'll be studies out, but then when you get down to it, you know, the very ones that are promoting the drugs are doing the study. So, do you believe that?*
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>
> **Informant:** *We're relying on government agencies to tell us or give us their opinion as to whether or not these things are dangerous. And unfortunately just like supplements and caffeine and tobacco and everything, you can find research studies that are done by interest groups versus government. About every year a new finding comes out on caffeine that says it's good for you, it doesn't have any effect, or it's really bad stuff, and they're constantly updating. I mean we are left in a state of confusion many times as to what really are the true facts. Is it the last study? Or is the next one coming out?*

Implications of Organizational Models

The findings from this section suggest that those wishing to encourage broader support for environmental health work must address the absent and fragmented nature of public thinking about environmental health. Considering that, according to experts and the literature, the field *is* fragmented, this is a doubly difficult challenge, and will likely require a concerted effort to locate patterns and consistencies (about roles, standards, hierarchies, protocols, etc.) from within the field that can be communicated to the public, alongside efforts to promote policy changes that address the underlying fragmentation itself.

D. *Responsibility*: Who should do environmental health?

Much of the discussion about environmental health revolved around questions of responsibility, accountability, and control. In these discussions, informants moved back and forth between individual and public conceptions of responsibility, displaying echoes of a long-standing tension in American culture between individualist and collectivist sensibilities. The dominant model of responsibility is not simply a binary one, however, as many informants employed an assumption that corporate/businesses are responsible for environmental health issues. As a result, the American model of responsibility for environmental health is distributed among three primary agents: (1) government, (2) individuals, and (3) businesses.

1. Models of government responsibility. There was an overwhelming expectation among informants that government is primarily responsible for environmental health work. While usually taken for granted, once responsibility for environmental health threats was raised explicitly in the interviews, informants articulated a core assumption that government's job is to protect the health of the public from environmental risks. This tacit understanding of government responsibility can be further broken down into several constituent assumptions:

(a) Government is responsible for threats beyond personal control. Informants generally recognized a scale of happenings and hazards that transcend any individual's capacity to address and collectively assumed a necessary protective role for government in these arenas.

> **Informant**: *I would think that they would look at regulating air quality, water quality, noise quality: things that we can't really control; things that innocent children are exposed to without their knowledge. The amount of pesticides that are put in foods.*
> ---
>
> **Informant**: *We've got so many things being imported and exported, you know? If my child is going to consume them, I want to know that somehow they are all right. Cause I couldn't watch this product be birthed to my table, so I need to know that somebody is watching it, to make sure…in a way that's reasonable. [That] is what I'm looking for.*

(b) Regulating business is a necessary function of government. Informants also assumed a role for government in keeping companies accountable for keeping both their employees and members of the public safe.

Informant: *Regulation to me is just keeping an eye and making sure that people aren't, businesses aren't, taking advantage of their surroundings and in turn hurting people, innocent people.*

Interviewer: *So, if environmental health does regulate industry, what's their goal?*

Informant: *I think they've got to keep an eye on big business because I don't think industry is going to patrol itself. That would be like saying, "Okay, here's all these rules for the road. Now we know that there's a policeman at every corner." But just knowing that there are police out there, it makes you think, "Well hey, I'd better be careful that I don't break these rules." So I think we need somebody to patrol industry.*

Informant: *Because I'm one of these people that just feels like the government is way too involved in everything we do. But as quick as I say that I have to remember that – wouldn't I rather them be that way? That's what makes America such a great country. It's what makes us so safe. That's why you can go into a place and buy whatever you want and you know you're not going to get food poisoning.*

The final quote is notable in that it came from a self-identified conservative and that support for government regulations to protect the health of the public is first qualified as counter to her larger philosophical approach to and skepticism of government power. Similarly, the following quote in support of regulation also came from a self-identified conservative who elsewhere voiced a lack of trust in government:

Informant: *It almost reminds me of amusement parks. I will not ride a Ferris wheel at the overnight carnivals, you know, where they just show up one night. No, no! But [I] would at one that is in one place all the time, because I know they are regulated and [I] know they are checked. So it's kind of that check and balance. Is it safe because it's being double checked, and you know that they were not taking those short cuts.*

(c) Communication is a necessary instrument of protection. Informant discussions consistently displayed the assumption that it is government's responsibility to communicate with the public about risks to their health and strategies for prevention and protection. Many suggested that there was no way members of the public could stay up to speed on multiple environmental risks and

threats, and that they had the right to expect that their government was taking steps to inform, educate, and build awareness of these risks to health.

> **Informant**: *I'm sure a lot of people avoided the flu this year. Unfortunately, you probably can't calculate, you know, you can't measure things like that, but I'm sure it helped educating people like that, and I even noticed that! Like how many people sneeze into their elbow now?! It's amazing. Like two years ago nobody sneezed into their elbow, ever. Ever!* [CHUCKLE] *It's like unheard of.*

It should be noted that many informants emphasized the importance of effective government communication so that they as individuals could take appropriate steps to protect themselves and their families from contaminant threats. So, even as this model looks to public institutions as loci of protection, it falls back on a more fundamental attribution of individual responsibility, and a defined notion of contaminant threat as its defining characterization of the intersection between environments and health.

(d) Government cannot be trusted to protect because it is compromised by corruption and big money. At the same time that informants argued vigorously for a necessary and expected role for government in environmental health efforts, they displayed a broadly shared skepticism of government services and the extent to which their protective functions have been compromised by powerful vested commercial interests – what they called "big money." This model of corruption and a compromised integrity seemed derived from a default model of "corrupt politicians," even as it was applied without distinction to professional administrators and other government employees. A single gloss of "government" was used to paint with broad brushstrokes a model of corrupted public institutions writ large.[13]

> **Informant**: *If I had the lead poisoning complaint, [I'd] go over to the health department. But again, we're talking… about a lot of money. I mean, there's a lot of money involved. Who's really going to care? They know that these places exist.*

It is worth noting that there is an implicit model of expectation in the protective function of government embedded in this statement. This informant would plan to go to her local health department in the case of such an exposure. But this positive framing is immediately countered by skepticism about the integrity of the larger "government system" that structures such protective services. Other statements also point to a system compromised by large financial interests:

Informant: *I'm old enough now where I remember Jimmy Carter sitting in front of the fireplace back in the middle 70s saying we need alternative energies. I think that's one of the reasons I've become an activist because I know the reason we haven't progressed is because the people in charge of deciding the direction of our country have taken the bribes from the oil companies to make sure nothing changes, to make sure we stay in the dark ages to promote their obscene profits at the expense of our health.*

Informant: *I would never eat USDA grade [meat]. I don't care what it is because I've talked to butchers and the stuff that they cut out of your meat, the tumors, I mean it's just horrendous. I'm sorry; they're in charge of our food supply – Monsanto, all those guys. You could almost go so far as it's a conspiracy to wipe us out. The chickens fed hormones, fed antibiotics. They're not free range.*

Interviewer: *Who do you think is involved with that kind of [radiation] waste? Because you mentioned about the doctors, with the medical radiation, but with the plants and all that waste…*

Informant: *Oh, I'm sure there's a government agency. I can't, of course, tell you the name of it, but I'm sure there's multiple government agencies that try to protect people – either protect people or blind them as to what's going on.*

Echoing the themes of corruption already described, this Colorado informant invokes the question of trust relative to a government of "them":[14]

Informant: *You know, I'm totally an American. I love America. I vote and try to be very concrete on that and look at other views but….I still know better than to just trust anybody…. [CHUCKLE]….I don't know, I really, I think there is a lot of corruption and I think it is real easy to pay people off in that way to, as it so seems to have [been] over the years with lobbyists and this and that. So, I really, I don't know. I don't know that I would trust them.*

2. Models of individual responsibility. While every informant recognized and advocated for a role for public agencies in environmental health, there was an equally dominant assumption about the responsibility and role of individuals in terms of actions and behavior that are subject to personal control. Previous FrameWorks research has encountered a deep and recurrent pattern of modeling individuals as the primary locus of responsibility across multiple domains.[15] This individualist model has roots that run deep in American culture, and its effect on public understandings of environmental health was clear and dominant. Generally,

the assumption about individual responsibility takes the form of an idealist model, advocating for how individuals *should* be living their lives.

(a) Idealist model: Individuals are personally responsible for their health. The following quotes demonstrate this assertion that people should aspire to take responsibility for their own health. In the first quote, the informant calls for heightened individual responsibility, even as she acknowledges a role for public institutions. You can see that the strength of the individualist model trumps other, more systemic notions of responsibility:

> **Informant**: *Environmental health has to start with you. And it has to start with each one of us doing our part: not buying the plastics; not eating the foods that are bad for us; trying our best to do what is right for our environment. If every person did that, it would make a big change, and then I also think we need to campaign for better air, for better water, for better control, because there's not everything that is within our control, but we do have a voice. We do have a voice and we need to use it, and am I the first one to tell you I'm guilty of that. I mean, I'm not all there, so I'm not pointing fingers, but…we have to start thinking about the things we do that affects generations to come. I think about my grandkids, what are they gonna have?*
> ---
>
> **Informant**: *I think everybody has a personal responsibility to think about how their actions are affecting all of the topics you just brought up. I think everyone has the personal responsibility to themselves and to people that live in the environment with them and the people [that] are coming along after we're gone. I think everyone has a responsibility to think about how they're affecting one of those topics.*

In the following quote, an Indiana informant articulated a particularly strong version of the model of individual responsibility, arguing that a personal behavior is the source of all chronic diseases:

> **Informant**: *I believe that every chronic disease has a trigger. Every chronic disease is connected to a habitual behavior, that if we'd stop the behavior, we'd stop the disease. I promise you. I almost guarantee it's one behavior, or maybe two behaviors that feed into that chronic disorder. If we stop the behavior, we stop the disease. I almost guarantee you*.

Embedded within this quote is the same assumption that is evident in the first two quotes: the ideal that individuals are and should be responsible for their health, including taking control of their environmental exposures. At the same time,

however, Americans have a strong realist streak, which often bumps up against their more idealist assertions of individual responsibility.

(b) Realist model: "Ignorance is bliss." The strength of the idealist model of personal responsibility was countered, frequently by the same informants, by a corresponding assumption acknowledging that people often are not very responsible in practice. In short, while people can and should take more responsibility for their personal health, they often do not. Many informants asserted that – left to their own devices – individuals will not necessarily "do the right thing" in terms of taking precautions, seeking to educate themselves, or taking a proactive approach to environmental health matters. There was a corresponding recognition that many people prefer to be ignorant of risks and to avoid the discomforts of possible proactive action or remedies.

> **Informant**: *I think people are overwhelmed. They have enough to do in their day-to-day lives that you just adapt to your environment, and you make the best of it, and you hope for the best.*
> ---
>
> **Informant**: *I know just in general I'm one of those people that just wants to be happy all the time, and doesn't want to have a bad thought in my mind and if you just look away, like pretend that coal plant doesn't exist. Because it will just ruin your day, you know?*

Regarding a local nuclear plant in the Cleveland area, one informant commented:

> **Informant:** *Out of sight, out of mind, you know?*
>
> **Interviewer**: *How do things stay "out of sight"?*
>
> **Informant**: *Because we choose to put our heads in the sand. We don't want to see all of the negative a lot of times. If we thought about all the scary things in our world that could happen, I mean, you'd go walk around like a nut. We'd all think the sky is falling. I don't know.* [LAUGHTER] *I try to be optimistic. When you start itemizing…this stuff… it's scary!*

It is worth noting that this avoidance pattern likely contributes to the broader pattern identified in this analysis: the default undervaluing of environmental health work by members of the public as they avoid engaging with the details and realities of environmental health threats in the first place.

3. Models of business responsibility. As with the modeling of individual responsibility, this discursive construction of corporate responsibility included both idealist and realist models – and an uneasy tension between them.

(a) Idealist model: Businesses should be responsible.

> **Informant:** *The big industrial companies that… I'm sure are concerned about pollution, making sure that it's not giving out too much pollution. I don't know how they've done that to make sure that it is safe, but, you know, I'm sure they are. There's an area in Houston and of course all those chemical companies are around there. They need to make sure that they're not giving out all the fumes and exhaust of, you know – keeping the air and the environment clean and stuff. I know there've been a lot of health problems in that area for a while there…because of the plants out there.*

Note the language of surety in the above statement, even as the informant acknowledges that the area around these factories has a reputation for health complications. She wants to have faith in companies trying to do the right thing. Another informant invoked the concept of trust, and the role played by the self-interested profit motive in keeping the food supply safe, even as he also acknowledged the protective role played by the FDA.

> *Informant: There's a whole chain of people I'm trusting. There's the people that grew the meat. There's the people that cut it into cuts, the butchers, the processing plant, the people that deliver it, and then the people that present it. I'm trusting a whole lot. I mean, even the people that make the Styrofoam that it sits in, and the plastic it sits in, and hoping things don't leak into it. And I'm relying on myself to be able to distinguish, is this healthy meat; does this look good? … There are some… mechanisms in place, but I think it's mostly trust… but the mechanism in place is capitalism, where if I hear Odwalla products caused some, you know, eight little children to die around the United States because of E. coli, I'm not gonna buy it. That's one thing. And then the other thing is, Food and Drug Administration maybe…lawsuits. There's a reactive side.*

(b) Realist model: The power of the "bottom line." In the end, most informants who addressed the topic of business responsibility articulated the assumption that businesses usually cannot be trusted to do the right thing and that, therefore, it is right and proper for government to place constraints on business action to protect the well-being of the American people.

> **Informant**: *There should be a certain amount of trust that we have in our government, in the food administration, to say we're not going to feed you*

anything that's going to kill you. We're concerned about you being healthy. That's not happening. Not really, not like it should.

Interviewer: *Why not?*

Informant: *Because of greed. Because people want to make as much money as they can. They want you to get addicted to their products, they want you to get a taste for their foods so that you keep coming back and spending more money on it. They want to make sure that you're getting just enough that they're filling you up in that moment and then the next hour or so, you'll be hungry again so that you come back and get more. It's a control mechanism, to me. It's a control mechanism.*

Interviewer: *Some folks say, "Hey look we don't need all these food safety regulations, cause if I'm running a restaurant and people get sick eating at my restaurant, they're going to go to another restaurant. I'm gonna go outta business, so it's in my interest to keep a clean restaurant. I don't need the feds or the state breathing down my neck."*

Informant: *We have a thing in play there called human nature, and human nature says "do it the quickest and easiest way possible, and if you can avoid a rule do it at all costs." I think a mom-and-pop operation, where the owner is the food preparer and there are maybe two or three employees...at that level and scope I think people have their own self-interests at heart and serving good food is a primary directive. It's their survival. But when you get into something like Texas Roadhouse, where you've got ninety restaurants and five hundred and seventy-six employees and a manager and two levels of management and three shifts of employees. Uh...without supervision and constant vigilance, bad things will happen. That is human nature.*

In summary, this distributed model of responsibility for environmental health represents, on the one hand, a complex cognitive landscape. Yet, there are clear and consistent lines of reasoning that characterize that landscape, and that revolve around a central issue of *control*. As strong as the individualist model of health is, Americans recognize threatening environmental forces in the world that transcend individual agency and believe that these threats should be addressed by government. These include threats from corporate and large business forces.

Implications of Responsibility Models

1. Model of government as a corrupt "them" discourages support.
Communications that seek to promote support for public environmental health efforts must remain cognizant of this dominant model of government – a model of an undifferentiated entity presided over by a few elite and compromised individuals. This model obscures any understanding of the specific public efforts, systems, and processes that are in place to protect the public. As such, messaging efforts will want to cultivate a cognitive distinction between politicians – who are often collectively glossed in negative terms – and those government agencies and public structures who work "in the trenches" on a daily basis to protect the public.

2. Positive model of government as protector provides an opportunity. Despite critical understandings of an undifferentiated and compromised "government," informants also spoke consistently to the importance and necessity of governmental environmental health efforts to protect the public. This protective model was strongest when framed relative to broad, large-scale environmental health threats and to fears about for-profit commercial activities that threaten human health. Framing strategies should seek to engage this positive, often proactive, model of government fulfilling its core responsibilities to the public that it serves. Further research is necessary to assess an effective strategy for invoking this model, one that might or might not include using the explicit language or value of "protection."

3. Dominance of the individualist model constrains perspective. In light of the tendency to attribute effective environmental health measures primarily to individual efforts, communications will want to reframe much environmental health work as something transcending individual capacities and reconfigure an understanding of primary environmental health challenges as ones that demand public rather than private action. This reframing strategy will need to correspond with a broader effort to reframe environmental health challenges and opportunities as macro in scale and not subject to individual choices and measures.

4. "Ignorance is bliss" assumption fosters disengagement. Informants suggested that Americans are unwilling to engage the full spectrum of environmental health challenges confronting the nation and world. This "realist" approach opens up a cognitive space for avoidance, disengagement, and fatalism about the capacity of the public to participate in and support strengthened environmental health efforts on their behalf. A model of "knowledge is power" or enhanced accountability or some equivalent thereof will need to be offered as a counter, such that the public can embrace a sense of potential and the capacity for successful engagement with the threats that do exist.

5. Assumption of business responsibility is a promising stepping-stone. The assumption that businesses should contribute to assuring the environmental conditions of health opens a communications opportunity to promote positive models of *both* business and government action. Such messaging might assert that businesses are expected to be responsible agents of environmental impact on human health, caretakers of the wellbeing of those affected by their commercial activities. Likewise, messaging could promote the protective and sanctioning role of government (see above) when businesses fail to live up to their expected obligations to the public. Activating this positive model of commercial responsibility also serves to (a) counter deterministic models of businesses as necessarily destructive to environmental health, (b) cultivate understandings of responsibility that go beyond the individualist model, and (c) inoculate against the oft-assumed antipathy between business and government, which dampens agency.

E. *Solutions*: What should be done about environmental health?

Throughout the course of interviews, informants articulated a range of proposals and solutions to address the environmental health challenges and problems. Below we review the assumptions that structured this area of conversation.

1. Individual and household behaviors are key to solving environmental health issues. Informants made assumptions that the primary means through which to address environmental health concerns was at the individual level – again relying on a highly individualist model. These included simple things like putting a filter on your faucet or not spreading pesticides on your lawn. While government was looked to as a hoped-for source of reliable information, responsibility for awareness and knowledge was overwhelmingly directed at individuals.

> **Interviewer:** *So how do those two things [environment and health] affect each other?*
>
> **Informant:** *I think it's also about our planet, and how we've just destroyed so much with the pollution, with garbage, with plastics. It could be that, too.*
>
> **Interviewer:** *So, there's a part of it that's planetary. How does that fit into the concept of "environmental health"?*
>
> **Informant:** *Well, you know, we are all responsible to be good citizens, and to recycle, to make sure we're not polluting our water. For instance, you can throw away chemicals, and they can end up in the water, or you can flush*

stuff down your toilet, and that ends up in the water. I know that there's been things on the news about all the prescription drugs that are showing up in our water system.

Or consider this exchange, which starts with a question about why some neighborhoods in the Dallas area have more trash than others and then leads into a concern with spreading contagions:

Interviewer: *What makes it that way? What influences it to be that way?*

Informant: *The ignorance of the people. Why don't they think about things like that? Why don't they think about picking up after themselves and making sure that their hands are clean, or making sure that they clean up after their pets if they're outside where people are stepping into it. Or, they're going into their homes and people don't take off their shoes and they're bringing in whatever they step onto outside into their homes*.

2. Local empowerment is important. Companion to informants' skepticism of government integrity in the face of "big money" lobbying was a countervailing bottom-up understanding about the importance of more participatory models of local empowerment and civic engagement in shaping government policy and priorities on environmental health issues.

Interviewer: *What actions do you think the government needs to take to address…*

Informant: *Giving the people a voice would help. Even something as small as a forum where they can say what they want to say. I guess they do that in a sense, with your city council meetings, or your places where you can talk about it. Even something like what you're doing right here. Go out and find people, and ask them what they think, and what they think can be done, and then take that information and use it. Just give the people a voice. Give them a way to say what they want and what they don't want*.

Informant: *I really think there are some wonderful minds that have wonderful ideas that are going to help us come up with good ideas to fix our health and the environment and things like that. It's not going to come from the top down. It's going to come from the ground up. You test market a community. You find things that work. You shoot it out.*

After describing an area in northwest Indiana that has endured air pollution from factories in Gary, Indiana, and has become known to some as "Cancer Alley," an Indiana informant asserted:

> **Informant**: *We the people. It's our environment… We have to solve our problems. Nobody cares more about St. Joe County [Indiana] than we do and we sit back voiceless on the issues… They're finally pulling soft drinks out of schools and it's a no-brainer. These are things people want and they're totally powerless to do these things. You know? We sit back and let seven goofballs on the school board…they can't even figure out how to do lunches and we're expecting them to fix our education system? It's ludicrous.*

Linked to the argument for increased local engagement were several calls for the increased localization of systems of production, in particular for food production.

> **Informant**: *We used to have a slaughterhouse, or several slaughterhouses, right here in our community and that's where we got our meat. So, if there was a problem, it was pretty much localized and we've got to get back to that.*
> ---
>
> **Informant**: *I just feel like there, in other countries, people are doing the right thing because it's their livelihood to do the right thing. Whereas I think we're so disjointed from that, from the final product. Like if you have your own chicken company, you're not going to sell somebody a bad chicken because they'll never buy from you again. You know? Because you're it. You know at the bakery, if you sell bad bread… at a restaurant, or whatever, the place that sells the fruit… But here, we're so far from that. I want somebody to keep an eye.*

It is noteworthy that the second informant concludes her assessment with a call for regulation, in recognition of how far we are from a scenario where food production is locally accountable.

Implications of Solution Models

1. A focus on individual decisions shifts attention away from public solutions.
Embedded throughout informants' discussion of environmental health was a consistent model that individuals can make decisions at the personal and household level that will protect them from environmental health threats. Communications should avoid invoking this dominant model in favor of cultivating models of both corporate responsibility and government agency in addressing environmental health challenges.

2. A tricky call for local empowerment. Considering the posture of separation from government ("government" is "them"), it is notable how informants also spoke to a corresponding desire for more participatory forms of government in the service of improved environmental health. This hope for local empowerment presents a communications opportunity, as messaging can seek to align local interests with those of public agencies working on their behalf. At the same time, a cautionary note is necessary; calls for government engagement with local communities often reinforced the individualist model, as informants spoke to how public institutions (schools, government) can function to empower *individuals* to make better choices.

Recessive Cultural Models

Several other shared and patterned assumptions emerged from the cultural models interviews and, although these models were not as frequently employed and were not used with the same degree of automaticity as the dominant models described above, they are nonetheless important. We call these "recessive" models, as they can be thought of as ways that are available to the public to think about environmental health, but are patterns of reasoning that individuals don't readily or automatically employ. Put another way, these recessive models require specific cuing to become active in the mind. We pursue these recessive models as promising avenues of thinking because they seem to help informants engage in more productive understandings of the target issue relative to many of the more dominant models described in the previous sections.

1. Built environments have health impacts. While open-ended questions about environmental health invoked statements about air and water quality and food safety, several of our informants showed sensitivity to the structuring of physical space as a factor shaping people's health.

> **Informant:** *When I hear "environment," I think of the world we live in, whether it be the overall world, or the community. That's what I think of: the things that we do within the world that we live in to affect us either adversely or in a positive way. Look at those people sitting out on that bench right there. That's a real positive thing. They provided an environment where they can sit and relax and talk. That's a real positive thing.*
> *---*
>
> **Interviewer**: *What affects your environment?*

> **Informant**: *If it's clean, for the most part. The weather is nice, and oh, that would be also considered as far as the brain, a lot of entertainment things to do. And lot of health things to do, there'd be a lot of trails.*
> *---*

> **Informant:** *But [if] you're living on Shaker Square, it's easy to go to one of the restaurants and pig out, get a burger…or get whatever. It's nothing to get up and go to McDonalds, cause there's one around the corner from everybody, you know…everywhere.*

Other informants discussed the positive benefits of public parks. Several informants suggested that these aspects of collective infrastructure have positive impacts on people's mental health and overall sense of well-being.

> **Informant:** *Your environment is where you live. It's what surrounds you. It could be … physically. It also could be mentally. You know, do you live in an environment of stress, high stress? Do you live in an environment where maybe you're in the country and you're more laid back, and you're not rushing day to day, right? I mean, that's "environment," as well. There's a social environment. There's a physical environment.*

Implicit in these statements is a recognition that the kind of infrastructure available shapes patterns of decision making and behavior, and with them, health outcomes. In other words, despite a common emphasis on individual decision-making, there was occasionally a deeper, if recessive, understanding that health is *not* simply a matter of individual choice.

Informants also displayed sensitivity to the health implications of built environments via negative models of building and development. Multiple informants spoke to urban "sprawl" and its costs, including added commute times and increased carbon emissions, along with encroachment on animal habitats.

> **Informant:** *I feel like the continued development – especially here in the Dallas area and the Fort Worth area – expanding outward is an issue…even being out here is a threat to public health. I had to drive quite a ways and in my opinion there's a lot of places to live within the Dallas city limits and the Fort Worth city limits. It just seems like an incredible amount of expanding and building and encroaching on land that used to be open and so…more pollution, more noise pollution. I think it encroaches upon, as far as animals are concerned I feel like it sort of drives them out of their natural habitats. I think it's adding to people's commute time, which adds to our air quality…*

Implications of the model of built environment: In alignment with expert thinking about a critical frontier of environmental health work, this recessive model should be encouraged and built out in messaging efforts, as it both widens the scope of environmental health and extends beyond the contaminant model to include other mechanisms of impact. It also has the capacity to cultivate new kinds of thinking about the social and economic determinants of health and their distribution across place and region.

2. Social relationships are part of one's environment. Multiple informants also expressed nostalgia about a former time of connectedness among neighbors. Embedded in these expressions was an assumption of social relationships as a critical feature of the environment that affects human health. Others spoke more directly to the importance of social relationships to the quality of one's environment.

> **Informant**: *The socialization, cause it's pretty much nowadays, we kind of want to keep to yourself instead of, "Hey, how are you doing, Mary? How you doing, John?" …There's no togetherness, and safety.*
>
> **Interviewer**: *So what kind of things do you think about "safety"?*
>
> **Informant**: *Well, that's probably another reason why people aren't socially connected, cause it used to be, when I was younger, everybody watched everybody. You know, kids playing on the street. There's barely any kids to play on the street because nobody wants their kids to go outside in an environment that isn't safe, you know? But one thing that, like I said, that cause and effect, if you had a Rec [center] where everybody goes, then you could be socially connected.*
> ---
>
> **Interviewer**: *What shapes our environment?*
>
> **Informant**: *Our relationships with our family, our children, our neighbors, our church, our friends, people we meet and greet. It would be my relationship with my husband and my children – I would want it to be a good environment, so that would spill out to others that I meet.*

Implications of the model of social environment: This model also serves to expand thinking about the scope and means of environmental impact on human health, moving public thinking away from a dominant contaminant model and into a broader conceptualization of how humans create the conditions of health through the quality of the interactions they share with each other.

3. Economic conditions have health impacts. The assumed connection between economic conditions, such as the challenges of poverty, and environmental health also emerged with sufficient regularity to warrant attention.

> **Informant:** *If you can't afford anything, and you're living in substandard areas, or you can't have good food – I mean, healthy food… Because, if you're eating all starches and all fats, because all you can afford is a pot of potatoes, then you become obese. And so you can't really live healthy because you're eating the wrong foods, because you can't financially afford to eat the right things. They talk about "health," but then, the "financial" part of it is that you can't afford it.*
> ---
>
> **Informant**: *[T]hink about a child that grows up in an urban area whose parents both work, that is maybe poorer. They can't afford the good organic food or the water … I mean, eating garbage! I mean, the school lunches are awful, and some of these kids can't afford anything else. So why wouldn't that be their environment? Sure it should be. I mean, they have no choice. Compared to, maybe the child that lives in a rural environment [where] his mother's home every day, and [who's] cooking them, you know, healthy foods? And I think, the poorer the children are, the less choice they have.*

Implications of the model of economic impacts. As with the recessive models of built environments and social impacts on health, this sensitivity to the health impacts of economic conditions opens up a communications opportunity to expand the public's thinking about the range of factors that impinge upon human health. In light of the dominant model that "everyone deserves to live in a healthy environment," it likewise provides an opportunity to explore new ways of framing disparities of wealth across regions as counter to this core value.

HOLES, OVERLAPS AND GAPS IN UNDERSTANDING

The primary goals of this analysis have been to: (1) document the way experts define the parameters of the field of environmental health, (2) establish how the lay public understands this field and work, and (3) compare and "map" these explanations and understandings to reveal the overlaps and gaps between these two groups, along with their implications for communication. We now turn to this third task.

This mapping exercise is an integral part of FrameWorks' Strategic Frame Analysis™ methodology, and a necessary first step in the effort to design simplifying models and clarifying metaphors that concretize key concepts and

cultivate more productive thinking about environmental health work among members of the public. Designing these models and metaphors requires a detailed, in-depth understanding of the terrain of this "map," and in particular the locations and characteristics of overlaps and gaps between expert knowledge and public thinking. As such, it is an essential step as we move from the largely descriptive research laid out in this report to the more prescriptive reframing experiments that will follow.

Perhaps the most important finding from this research is not a gap but a "hole." Our research showed clearly that members of the public have implicit understandings of environmental health threats, and about what steps they can take as individuals to protect themselves and their families. Beyond this assessment of threats and personalized responses, however, our research demonstrates a lack of active thinking about broader environmental health efforts being made, in particular by public institutions. This is a critical finding, revealing a "hole" in the public's day-to-day thinking about this important arena of work. This is not to say that Americans have no capacity to think about environmental health work or that there are not other dominant models that they draw on to make sense of it. When circumstances arise that challenge that absence – a catastrophic oil spill in the Gulf, a child's allergic reaction to a cleaning agent, or (more benignly) an interviewer's line of questioning – people are able to generate and bring up models derived from previous experiences, reaching back into a storehouse of understandings that allow them to make sense of the issue at hand. Precisely because the topic has not been a part of active thinking, considerable effort is required to respond, and both the speaking and the thinking behind it exhibit a lack of fluency, practice and coherence. Our interviews demonstrated this clearly. Most informants struggled to generate responses to questions about existing environmental health work and efforts. Having a poorly articulated model of "environmental health" work, they invoked models from "kindred" domains – "environment" and "health" in particular – and returned repeatedly to the more familiar and problematic arena of environmentalism.

In summary, informant conversations about the unfamiliar terrain of environmental health work were "scaffolded" by assumptions from familiar and comfortable domains. In this effort, informants revealed a range of conventionalized and culturally specific ways of thinking and talking about environmental health work. These cultural models intersected with expert knowledge in a variety of ways, revealing both substantial overlaps and gaps in thinking, both of which have important communications implications.

Overlaps between expert and public models of environmental health work

Our expert informants and the broader literature from the field of environmental health address the complexities, challenges, and promises of environmental health work with a specificity and perspective borne from years of experience working, teaching, advocating, and researching in the field. Meanwhile, public informants struggled even to make sense of the term "environmental health work," let alone speak with fluency to the contours and nuances of this field and practice. And yet, members of both groups struck several common chords. These provide promising common ground for developing communications strategies to bridge the clear gaps that also emerged between expert and public thinking on the subject. The most noticeable areas of agreement between experts and the public are the following:

1. Proactive approaches. Both experts and members of the public spoke to the benefits and necessity of anticipating environmental health challenges and taking preventative measures before problems arise. Both cited the oil spill in the Gulf as an example of failed precautionary efforts, and recognized that material and human costs escalate when effective preventative measures are not taken.

2. Public agencies are key. Once actively discussing environmental health measures, public discussions moved towards expert understandings in asserting that government is and should be responsible for a substantial portion of environmental health work. While both experts and public informants spoke to a necessary role for individuals in taking environmental health precautions, both affirmed a public role in those arenas beyond personal control. It is crucial to note here, however, that public informants articulated this model of governmental importance in the context of a formal interview process about environmental health work, and that efforts by public agencies are largely taken for granted and under-appreciated on a day-to-day basis. Engaging the public on the importance of government in environmental health efforts will require cognizance of both the content of this lay model (government is key) and its typical absence from public thinking.

3. Education and communication. Both experts and public informants also spoke consistently to the importance of cultivating increased awareness among the public about environmental health challenges, risks, and proactive measures. Both sets of informants looked to public institutions and agencies as bearing primary responsibility for this communicative task.

4. Effective work compromised by vested commercial interests. Experts and public informants alike recognized that large commercial interests are often vested

against policies that constrain profits for the sake of protecting the environment and with it human health.

5. A fragmented field. Both experts and the public spoke of the environmental health field as a fragmented one – spread across multiple agencies, levels of government, professional skill sets, and domains of authority and responsibility. While experts spoke to this fragmentation directly, this fragmentation was evident in more implicit ways in interviews with members of the public, as these informants struggled to articulate a coherent sense of the field's organization.

These five areas of overlap between expert and public thinking on environmental health work offer promising avenues for developing successful communications strategies that are both consonant with expert knowledge and build off of realistic and available patterns in public thinking. The first three overlaps are particularly promising in that they represent positive models of proactive public environmental health work and speak to a broadly shared vision that provides solid grounding for building prescriptive reframes. The final two overlaps also present communications possibilities, involving a careful effort to reframe these negatives as possible arenas for positive change and new kinds of policy and thinking.

Gaps between expert and public thinking of environmental health work

In addition to overlaps, several major gaps emerged between expert and public thinking about environmental health work. These gaps represent critical sites for expanding public thinking in the effort to bring it into greater alignment with expert knowledge and build support for positive developments for the field. These gaps also represent key challenges as the research shifts from a descriptive to prescriptive mode and seeks to develop communications devices that can successfully bridge these gaps by building new ways of thinking and talking about environmental health work. Six notable gaps emerged:

1. Default salience. While public informants spoke to the importance of environmental health threats directly and could identify specific dangers with ease, they largely took for granted environmental health work and the protective efforts being made on their behalf. It was only with prompting and through the course of the interview discussion that the importance of those efforts became articulated. By contrast, expert informants spoke without prompting to the importance of environmental health work and its critical role in both protecting the public and seeking to build the conditions for human health.

2. Scope of reference. Experts addressed the full scope of environmental health impacts, from household and personal ones (e.g., exposure to "under-the-sink" chemicals) to global events (e.g., climate change), and everything in between.

Public informants spoke overwhelmingly to the local and domestic spheres of events, while the shift to a global perspective often triggered an environmentalist model that moved informant thinking away from ideas of human health.
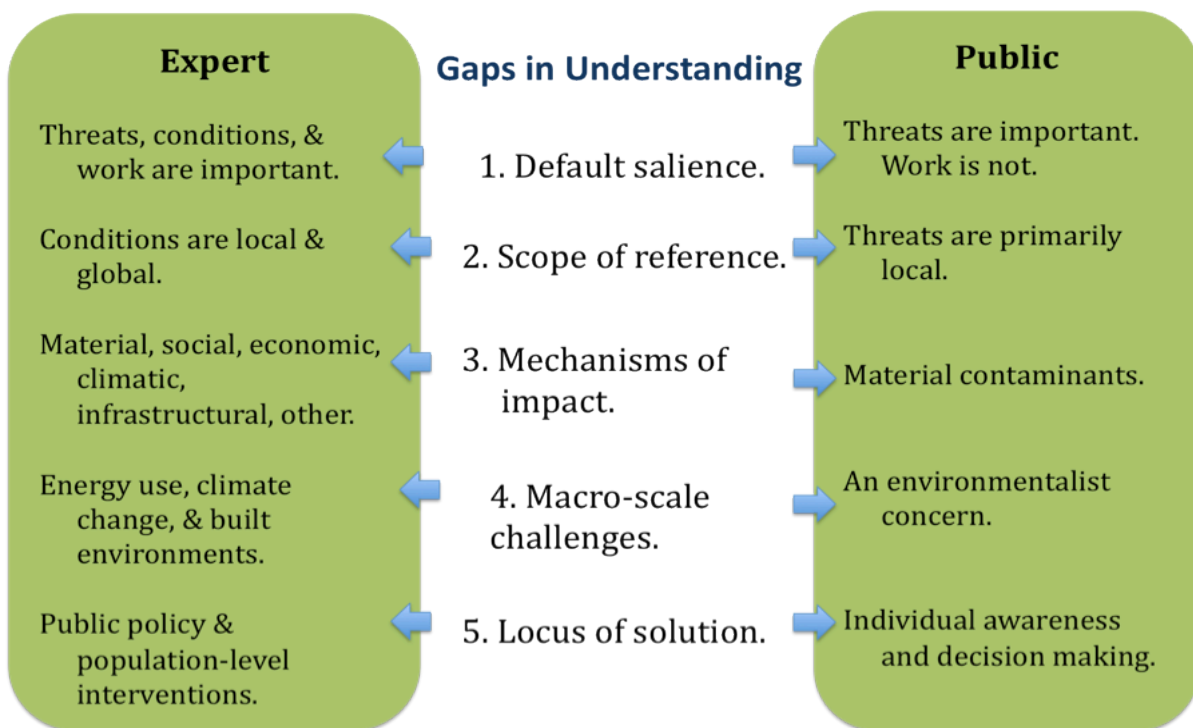
3. Mechanism of impacts. Public informants consistently invoked a "contaminant model" of environmental health — describing negative impacts as the result of exposures to toxic materials (e.g., germs, chemicals, pollutants, steroids, pollens). Experts also acknowledged very real material threats to human health and the fact that risk assessment and management efforts are foundational to the field's identity and work. Yet experts also articulated a broader notion of environmental health impacts via behavioral, social, economic and infrastructural factors that shape patterns of human health in both positive and negative ways. Attention to "built environments," for example, was a strong theme in the expert view but a relatively weak part of the public's model of environmental health.

4. Relationship to environmentalism. Experts articulated a clear distinction between environmental health and environmentalism ("people, not polar bears"), while public informants often blended the two and supplanted environmental health concerns with classic environmental ones ("people are harming the polar bears"). Communications efforts to build knowledge about and support for environmental health efforts will need to pay close attention to this public tendency and seek ways to distinguish the mission of environmental health work from (though not necessarily in opposition to) that of environmentalism.

5. Macro-scale challenges. Experts and the public shared a strong concern about toxic substances in air, food and water, and pointed to them as the primary threats that require strong and consistent action. Experts, however, also spoke consistently to a larger set of emergent issues that represent key environmental health challenges, most notably climate change and the patterns of energy use that contribute to it. For most members of the public, however, climate change was primarily an environmentalist issue, not one of environmental health.[16]

6. Locus of solution. Experts consistently spoke to the impact of population-level interventions and public policy as the key arenas for action in facing environmental health challenges. Public informants spoke consistently to individual behaviors and collective values as the key frontiers for environmental health action.

Figure 2: Mapping the Gaps in Understanding

Expert	Gaps in Understanding	Public
Threats, conditions, & work are important.	1. Default salience.	Threats are important. Work is not.
Conditions are local & global.	2. Scope of reference.	Threats are primarily local.
Material, social, economic, climatic, infrastructural, other.	3. Mechanisms of impact.	Material contaminants.
Energy use, climate change, & built environments.	4. Macro-scale challenges.	An environmentalist concern.
Public policy & population-level interventions.	5. Locus of solution.	Individual awareness and decision making.

CONCLUSIONS

Through analysis of interviews with members of the public, and research with experts in the field of environmental health, this report examines how these two groups think about the field and work of environmental health, and considers the implications of those understandings for environmental health communications. Our primary goals have been to define how dominant cultural models limit public thinking, and to locate specific overlaps and gaps between expert and public understandings about environmental health. Strategic communications must address both of these challenges — redirecting public thinking away from conceptual traps posed by unproductive patterns of thinking, and filling in gaps where content knowledge is missing from the public understanding. Subsequent phases of prescriptive framing research by FrameWorks, including the design of frame elements such as simplifying models and values, will explore precisely how experts and advocates can most successfully address the communication challenges presented here. Overall, the report demonstrates the pressing need for experts and reformers to work on providing Americans with alternative ways of

thinking about the environmental conditions for human health, and the kinds of policies and public structures that can, and do, create those conditions. The research presented here documents a central challenge and question to address in subsequent communications research. While it is clear that the public has a robust model of contaminant threats to human health, it is also clear that they have a well-developed cognitive predisposition to avoid engaging with the reality of those threats, and with the efforts of those who would seek to address them. Further research must address this core challenge. Upcoming prescriptive communications research will address and explore this and other challenges that have become apparent in the descriptive research presented here.

While this research represents the first phase of a much larger investigation, several preliminary recommendations and future directions have become apparent. We present those here.

1. Share knowledge and success. In light of the taken-for-grantedness of much environmental health work, agencies should focus attention on communicating their competencies and capacities, and the critical nature of the effective, evidenced-based work that they do. This would also require them to link their successes to a bigger picture that connects causes and consequences. This is a challenging communications task that will require improved communications *within* the environmental health sector for its effective realization. That said, past communications that relied on the contaminant model of environmental health have been powerful (e.g., warnings about lead, mercury, arsenic, salmonella and asbestos) in shaping how Americans think about the safety of food, water and buildings. The challenge is to find effective strategies that communicate scientific knowledge about environmental health impacts that expand thinking about the cyclical relationship between environments and human health, and the non-material effects that environments have on the health of human populations. This will require further research into how best to strengthen non-contaminant based models of environmental health impact.

2. Speak to the conditions of health. Providing the public with broader ways to think about environmental impacts on human health requires a careful reframing of the relationship between "environment" and "health"; one that moves thinking beyond a negative model of disease control and towards a positive model of creating the *conditions of health*. Americans *do* have models of health based on conditional factors like stress, diet, exercise and even economic standing, but they are often framed through an individualist lens and not linked to environmental factors. The reframing challenge is how to link human health to other features of the environment that are not directly sources of contamination or contagion, and that are not subject to personal control.

3. Go beyond the basics. As noted by many experts and demonstrated by our research, the public has a strong association of environmental health with the core protective efforts of sanitation, air, water and food safety work. For many experts, this was cause to go "back to basics" in communications efforts, to activate positive thinking about a history of accomplishment in these arenas, and to advocate for further efforts to build upon that history of success. In terms of building support for *these* core functions, such a communications strategy is likely be effective. The question is whether such a strategy would inhibit the public's ability to expand their thinking more broadly about environmental health promotion and other non-material components of environments that affect human health. Previous FrameWorks research has found that once dominant models, such as the contaminant model, are triggered in thinking, it becomes very difficult to introduce new models or strengthen recessive ones. Future FrameWorks research will need to engage this complexity in the effort to cultivate ways of thinking that include, but go beyond, the basics, and build on extant recessive models that allow Americans to think about how human health is shaped by built environments, social relationships, economic conditions and differences of infrastructure among populations.

4. Focus on people. Considering the public's tendency to trend towards *environmentalism* when thinking and talking about environmental health, it becomes critical to keep the communications focus on people's health, habitats and well-being. Whether and how the term "environment" is used in communications efforts must be explored in further research, so that the most fruitful patterns of usage and non-usage can be established.

5. Clarify common mandate of the field. Americans lack appreciation for environmental health work in part because they have difficulty categorizing it relative to other institutions of public service, including those that provide health care and protect the environment. The public needs help doing this, and communications efforts should address this need directly by focusing on those standards, consistencies and regularities that do exist across the spread of EH agencies and personnel. Relative to the current situation, the roles of the CDC, FDA, USDA, EPA and other federal agencies need to be clarified, as do the roles of assorted state, local, and tribal departments working in environmental health. Considering the plurality of organizational structures, this is a daunting task, yet it is critical to the extent that other efforts to frame a more fluid and comprehensive understanding of environmental health will languish as long as Americans struggle to see EH as an organized field. Quite simply, modeling a coherent notion of environmental health work as a field of action requires a model of the agents who are doing said actions.

6. Invoke a positive model of safety. Models of health as safety have the capacity to galvanize support for efforts to make environments safer by assessing and

managing risk factors and promoting the development of healthy and safe conditions. However, considering the public's demonstrated tendency to avoid thinking about environmental threats that can seem overwhelming, communications should take care to cultivate a proactive and preventative modeling of safety that goes beyond definitions of risk.

7. Promote citizen engagement and local empowerment. Many of our public informants expressed a sense of disempowerment relative to both "big government" and "big money," and articulated a wish that mechanisms that strengthened local engagement and "voice" could be developed. Often articulated side by side with skepticism about government and corporate policies, and an acknowledged "ignorance is bliss" model of personal avoidance, these idealized models of an empowered citizenry nonetheless provide fertile ground for communications. Future research needs to test ways of cultivating inclusive models of environmental health work that shorten the cognitive distance between the public and environmental health agencies. At the same time, care must be taken to avoid triggering a "backyard" syndrome, in which people come to care deeply about *their* community while weakening their commitment to environmental health for all communities.

8. Carefully invoke government as protector. Despite an often critical and monolithic conception of "government," there is a core cultural model in which Americans assume that government should be a protective agent for its citizens. It endures as an organizing model despite the strength of the "get government off our back" rhetoric that has flourished in America over the course of the past 30 years and during previous episodes in American history. At its root, this protective model is premised in the realization that individuals are subject to forces beyond their control, and our interviews with members of the public demonstrated an encouraging trend: Even while strong free-market commitments and logic compel many Americans to resist government regulation of companies, the assumption of government's protective duty in the face of environmental threats to human health trumped even this strong market logic. As such, from a communications and framing perspective, the strength of this protective model warrants further research through various qualitative and quantitative experimental efforts. Tapping into this model has rich potential, even as it must be accomplished with great care. Past research suggests that cuing this model may require a circuitous framing path in order to avoid negative accusations of "nanny government."

Notes:

[1] See *Appendix 2: Theoretical Foundations* for a more detailed discussion of FrameWorks' approach to cultural cognition.

[2] In one exercise, for example, experts were asked to imagine that they were speaking at a Town Hall Meeting and had to explain "the three most important things to understand about environmental health," as well as their own work and research. In addition to the preset questions, the interviewer probed for additional information. For example, the interviewer asked questions that members of a hypothetical audience might ask in response to the informant's initial explanations. In this way, the interviews were semi-structured collaborative discussions with frequent requests from the interviewer for further clarification, elaboration and explanation.

[3] See: Glaser, B.G., & Strauss, A.L. (1967). *The discovery of grounded theory: Strategies for qualitative research*. Chicago: Aldine Publishing and Strauss, A.L., & Corbin, J. (1990). *Basics of qualitative research: Grounded theory procedures and techniques*. Newbury Park, CA: Sage Publications.

[4] See: Glaser, B.G., & Strauss, A.L. (1967). *The discovery of grounded theory: Strategies for qualitative research*. Chicago, IL: Aldine Publishing, and Strauss, A.L., & Corbin, J. (1990). *Basics of qualitative research: Grounded theory procedures and techniques*. Newbury Park, CA: Sage Publications.

[5] Priming informants with the content can be problematic in these interviews, as the ability to identify and describe cultural models relies on getting "top of mind" answers and explanations from informants, rather than carefully thought-out and pre-constructed responses to the issue in question. If primed with the focus of the interview, informants tend to "prepare" by doing "research" on the subject, yielding results that are actually not representative of their own understandings and explanations of issues.

[6] Quinn, N. (2005). *Finding culture in talk: A collection of methods*. New York: Palgrave Macmillan.

[7] For description of grounded theory analysis, see: Glaser, B.G., & Strauss, A.L. (1967). *The discovery of grounded theory: Strategies for qualitative research*. Chicago: Aldine Publishing and Strauss, A.L., & Corbin, J. (1990). *Basics of qualitative research: Grounded theory procedures and techniques*. Newbury Park, CA: Sage Publications. For description of social discourse analysis, see Strauss, C. (2005). Analyzing discourse for cultural complexity. In Quinn, N. (Ed.), *Finding culture in talk*. New York, NY: Palgrave Macmillan and Strauss, C. *Who belongs here and what do we all deserve? Americans' discourses about immigration and social welfare*. Unpublished manuscript. For description of cultural models analysis, see Quinn, N. (1987). Convergent evidence of a cultural model of American marriage. In Holland, D. & Naomi, Q. (Eds.), *Cultural models in language and thought* (pp. 173-194). Cambridge, MA: Cambridge University Press.

[8] See Ward, J.W., & Warren, C. (2007). *Silent Victories: The History and Practice of Public Health in Twentieth-Century America.* New York: Oxford University Press.

[9] Previous FrameWorks research on community health has demonstrated this pattern. See for example "Calories, not Communities: A Media Content Analysis of Food and Fitness News. A FrameWorks Research Report, March 2007."

[10] See Shanto Iyengar's book *News That Matters* (1989, University of Chicago Press) for other examples of how episodic framing undermines systemic causal thinking.

[11] Previous research by the FrameWorks Institute in Colorado, California, and Illinois about community health and the relationship between food and fitness has evidenced the strength of this model in people's thinking. See: "Health Individualism: Findings from Cognitive Elicitations among Californians. A FrameWorks Research Report, August 2006" and "Fitness as a Personal Ideal: Findings from Cognitive Elicitations in Colorado and Chicago. A FrameWorks Research Report, November 2006." Both can be found at http://www.frameworksinstitute.org/communityhealth.htm

[12] See also Kempton, Boster, and Hartley (1996). *Environmental Values in American Culture*. Cambridge: The MIT Press.

[13] This is a familiar trope that has been identified in other FrameWorks research dealing with American models of government. See for example "Mind and Monolith: Findings from Cognitive Interviews about Government. The Frameworks Institute, July 2004" and "Like Mars to Venus: The Separate and Sketchy Worlds of Budgets and Taxes. A FrameWorks Research Report, February 2009."

[14] This posture of separation relative to a government of "them" has been identified in previous FrameWorks research about government. This is a model of government as "monolith" – a mode of understanding that treats a complex collection of people, structures, and activities as a static, passive, undifferentiated "thing," very different from the sum of its parts, and much more cognitively real. See "Mind and Monolith: Findings from Cognitive Interviews about Government. The Frameworks Institute, July 2004."

[15] This model of individual responsibility for personal health has been identified in previous FrameWorks research as well. See for example the discussion in "Reform What? Individualist Thinking in Education: American Cultural Models on Schooling. A FrameWorks Research Report, September 2008," "Determinism Leavened by Will Power: The Challenge of Closing the Gaps Between the Public and Expert Explanations of Gene-Environment Interaction. A FrameWorks Research Report, March 2009," and "Conflicting Models of Mind in Mind: Mapping the Gaps Between the Expert and the Public Understandings of Child Mental Health as Part of Strategic Frame Analysis. A FrameWorks Research Report, July 2010."

[16] See the FrameWorks MessageMemo on "Framing Global Warming in Canada," December 2007.

APPENDIX 1: RESEARCH METHODS

Cultural models interviews require gathering what one researcher has referred to as a "big scoop of language."[1] Thus, a sufficiently large amount of talk, taken from each informant, allows us to capture the broad sets of assumptions that informants use to make sense of information. These sets of common assumptions and understandings are referred to as "cultural models." Recruiting a wide range of people allows us to ensure that the cultural models we identify represent shared, or "cultural," patterns of thinking about a given topic.

As the goal of these interviews was to examine the cultural models Americans use to make sense of and understand these issues, a key to this methodology was giving informants the freedom to follow topics in the directions they deemed relevant and not in directions the interviewer believed most germane. Therefore, the interviewers approached each interview with a set of general areas and topics to be covered but left the order in which these topics were covered largely to the informant. In this way, researchers were able to follow the informant's train of thought, rather than interrupting to follow a set and pre-established course of questions.

Informants were first asked to respond to a general issue ("What do you think about X?") and were then asked follow-up questions – or "probes" – designed to elicit explanation of their responses ("You said X, why do you think X is this way?" or "You said X, tell me a little bit more about what you meant when you said X," or "You were just talking about X, but before you were talking about Y, do you think X is connected to Y? How?"). This pattern of probing leads to long conversations that stray (as is the intention) from the original question. The purpose is to see where and what connections the informant draws from the original topic. Informants were then asked about various valences or instantiations of the issue and were probed for explanations of these differences ("You said that X is different than Y in this way, why do you think this is?"). In this way, the pattern of questioning began very generally and moved gradually to differentiations and more specific topics.

Informants were first asked a series of open-ended questions that provided them the opportunity to speak to whatever associations came to mind – about the meaning of the term "environmental health" and their ideas as to what the purpose of a hypothetical "Environmental Health Group" might be. Following a series of follow-up probing questions, a similar line of questioning was then addressed about "public health" and a fictional "Public Health Group." The interviewer also followed these questions with probes about any relationship between environmental health and public health. Informants were asked to expand upon their understanding of "environment" and then asked a series of questions about specific arenas of environmental health work, including sanitation, air and water quality, food safety,

and chemical and radiation exposure. While questions of definition, organization, and responsibility were distributed throughout each interview, a final series of questions addressed the topic of responsibility directly and offered each informant the chance to revisit or expand upon any of the topics already discussed.

As every interview has to begin somewhere, the order of questions likely had some biasing effect on the responses offered. So, for example, in analyzing the transcripts, it became clear that people's talk about public health, coming as it did after their discussion of environmental health, included more references to "environment" than would have otherwise been expected. If the interview had started with public health as a topic, these references would likely have been fewer. There is no easy solution to this biasing effect in interviews. That said, consideration of these effects were built into the analysis of the interview transcripts and considered when weighing the strength of particular patterns of articulation. Furthermore, some of the biases associated with question-ordering can be overcome by the fact that the object of analysis in cultural models work is implicit and tacit assumptions, rather than explicit views. Additionally, an advantage of the multi-method, iterative design of Strategic Frame Analysis™ is that subsequent research, using both other qualitative methods and quantitative experiments, will allow FrameWorks to triangulate results, examining possible biasing effects and verifying the results presented here.

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[1] Quinn, N. (2005). *Finding culture in talk: A collection of methods* (1st ed.). New York: Palgrave Macmillan. p. 16.

APPENDIX 2: THEORETICAL FOUNDATIONS

The following are well-accepted characteristics of cognition and features of cultural models that figure prominently into the results presented in this report and in FrameWorks' research more generally.

1. Top-down nature of cognition

Individuals rely on a relatively small set of broad, general cultural models to organize and make sense of information about an incredibly wide range of specific issues and information. Put another way, members of a cultural group share a set of common general models that form the lens through which they think and make sense of information pertaining to many different issues. This feature of cognition explains why FrameWorks' research has revealed many of the same cultural models being used to think about seemingly unconnected and unrelated issues – from education to health to child development. For example, FrameWorks' research has found that people use the mentalist model to think about child development and food and fitness – seemingly unrelated issue areas. For this reason, we say that cognition is a "top-down" phenomenon. Specific information gets fitted into general categories that people share and carry around with them in their heads.

2. Cultural models come in many flavors but the basic ingredients are the same.

At FrameWorks, we often get asked about the extent to which the cultural models that we identify in our research and that we use as the basis of our general approach to social messaging apply to ALL cultures. That is, people want to know how inclusive our cultural models are and to what extent we see/look for/find differences across race, class or other cultural categories. Because our aim is to create messaging for mass media communications, we seek out messages that resonate with the public more generally and, as such, seek to identify cultural models that are most broadly shared across society. We ensure the models are sufficiently broad by recruiting diverse groups of informants in our research who help us to confirm that the models we identify operate broadly across a wide range of groups. Recruiting diverse samples in our cultural models interviews often confuses people who then think we are interested in uncovering the nuanced ways in which the models take shape and get communicated across those groups, or that we are interested in identifying different models that different groups use. To the contrary, our aim is to locate the models at the broadest possible levels (i.e., those most commonly shared across all cultural groups) and to develop reframes and simplifying models that advance those models that catalyze systems-level thinking. The latter does not negate the fact that members of different cultural groups may respond more or less enthusiastically to the reframes, and this is one of the reasons why we subject the reframes that we recommend to our clients to

rigorous experimental testing using randomized controls that more fully evaluate their mass appeal.

3. Dominant and recessive models

Some of the models that individuals use to understand the world around us are what we call "dominant" while others are more "recessive," or latent, in shaping how we process information. Dominant models are those that are very "easy to think." They are activated and used with a high degree of immediacy and are persistent or "sticky" in their power to shape thinking and understanding – once a dominant model has been activated, it is difficult to shift to or employ another model to think about the issue. Because these models are used so readily to understand information, and because of their cognitive stickiness, they actually become easier to "think" each time they are activated – similar to how we choose well-worn and familiar paths when walking through fields, and in so doing these paths become even more well-worn and familiar. There is therefore the tendency for dominant models to become increasingly dominant unless information is reframed to cue other cognitively available models (or, to continue the analogy here, other walking paths). Recessive models, on the other hand, are not characterized by the same immediacy or persistence. They lie further below the surface, and while they can be employed in making sense of a concept or processing information about an issue – they are present – their application requires specific cues or primes.

Mapping recessive models is an important part of the FrameWorks approach to communication science and a key step in reframing an issue. It is often these recessive patterns of thinking that hold the most promise in shifting thinking away from the existing dominant models that often inhibit a broader understanding of the role of policy and the social aspect of issues and problems. Because of the promise of these recessive models in shifting perception and patterns of thinking, we discuss them in this report and will bring these findings into the subsequent phases of FrameWorks' iterative methodology. During focus group research in particular, we explore in greater detail how these recessive models can most effectively be cued or "primed," as well as how these recessive models interact with and are negotiated vis-à-vis emergent dominant models.

4. The "nestedness" of cultural models

Within the broad foundational models that people use in "thinking" about a wide variety of issues lay models that, while still general, broad and shared, are relatively more issue-specific. We refer to these more issue-specific models as "nested." For example, in our past research on executive function, when informants thought about basic skills, they employed a model for understanding where these skills come from, but research revealed that this more specific model was nested into the more general mentalist cultural model that informants implicitly applied in thinking this issue. Nested models often compete in guiding or shaping the way we think

about issues. Information may have very different effects if it is "thought" through one or another nested model. Therefore, knowing about which models are nested into which broader models helps us in reframing an issue.