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## The Information Behavior of Public Health Educators Working in Appalachia

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To the Graduate Council:

I am submitting herewith a dissertation written by Karen Jean McClanahan entitled "The Information Behavior of Public Health Educators Working in Appalachia." I have examined the final electronic copy of this dissertation for form and content and recommend that it be accepted in partial fulfillment of the requirements for the degree of Doctor of Philosophy, with a major in Communication and Information.

Carol Tenopir, Major Professor

We have read this dissertation and recommend its acceptance:

John W. Haas, Robert E. Levey, Catherine A. Luther

Accepted for the Council:

Carolyn R. Hodges

Vice Provost and Dean of the Graduate School

(Original signatures are on file with official student records.)

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The Information Behavior of Public Health Educators Working in  
Appalachia

A Dissertation Presented for  
the Doctor of Philosophy  
Degree  
The University of Tennessee, Knoxville

Karen Jean McClanahan  
May 2011

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## Abstract

Public health educators serve as a vital interface between medical and public health authorities and community members for the dissemination of important information related to disease prevention and health promotion. Public health educators deliver packaged educational programs, develop their own original programs, field impromptu health questions, and conduct community health assessments. This dissertation research employed a survey in January 2011 to illuminate the information-related attitudes and activities of health educators working in public health departments in Appalachia. The research questions explored how these health educators find and use information, how they perceive their information needs and their abilities to find and evaluate information related to their work, their satisfaction with the information resources available to them, and the impact of the economic and health status of their county or region on their information behavior.

Key findings include that respondents are frequent information seekers with high-speed Internet access, but they need better access to information and data related to their work. Respondents use the web heavily but have concerns about evaluating online information. Information literacy training must accommodate their workflows and budgets. Library resource use is currently low but has the greatest potential for meeting their complex needs. Suggestions include multi-dimensional collaborations between health educators and information professionals and a new, more information-centric role for health educators.

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## Chapter 1

### Introduction

#### *Health & Information*

Throughout history, “health” has been an important concept for human societies to consider, and one inextricably linked to one of their most fundamental goals -- survival. Simply defined, health is a state of physical and mental well-being, with the emphasis placed on medically oriented indicators of that state. Whereas “survival” draws on the harsh distinction between the states of life and death, “health” is a more ambiguous concept, broadly encompassing not just longevity, but also such notions as quality of life, disease prevention, wellness promotion, and physical functionality. While the concept of “health” entails many scientifically-defined medical aspects, it is simultaneously a social construct, which varies both over time and across cultures (McElroy & Jezewski, 2000).

The concept of health is one laced with multiple levels of meaning, which can be constructed and held, or acknowledged then disbelieved, by individuals, groups, or entire societies of people. Constructed meanings associated with the concept of “health” for the current-day U.S. society are substantially framed by the existing (and continually growing) body of scientifically-based medical knowledge, punctuated by pockets of commonly-held beliefs, the source of which could be as varied as centuries-old folk medicine or the emergent “alternative medicine” paradigm. The key point here is not to debate the relative veracity of different sources of meanings associated with the concept of health, but rather to note that the concept of health is supported by some kind of

collective knowledge about health, regardless of its provenance. The concept of “health” that is held by individuals, groups, or societies is dependent upon some understanding of what phenomena, beliefs, actions, and/or events either help to sustain health or cause it to diminish. The components of this understanding are units of health information, some examples of which (for current day U.S. society) are: “exercise promotes cardiovascular health”, “eat five servings of fruit and vegetables every day”, or “smoking increases the risk of some forms of cancer”. Health information can therefore be functionally defined for this study as pieces of meaning derived from the body of health knowledge, which are in a form that is generally understandable by members of a society.

Just as the definition of the concept of health has a quality of dynamic complexity that varies across the dimensions of time and culture, there are also temporal and cultural aspects associated with the definition of roles of people deemed as privileged interactors with or appropriate controllers of the body of health knowledge. In the past, or even in some present-day “primitive” societies such as the Native American cultures of the Amazonian rainforest, this role might be the responsibility of an individual shaman or small group of shamans entrusted with remembering and using the society’s accumulated knowledge about healing and harmful plants and natural substances, for the benefit of the health of the society as a whole. In oral cultures such as this, in the words of ethnobotanist Mark Plotkin (1993), “Every time a shaman dies, it is as if a library burned down.”

The analogous role in modern Western society is far more complex and fragmented, split in very specific ways between various types of institutions and

categories of people, such as health researchers, review boards, academic faculty, scholarly publishing entities specializing in health and medicine, and various kinds of health professionals, including physicians, nurses, and members of the allied health professions. In a society such as the current-day United States, there is another layer of individuals or institutions serving as disseminators of health information derived from the body of health knowledge. These disseminators do not create, approve, regulate, or revise the content of the body of health knowledge; instead, they serve as conduits of health information flow to members of the general society or to specific groups within that society. Examples of these kinds of disseminators of health information are health or medical librarians, nurse educators, medical journalists, portions of the print, broadcast, and online news media and its personnel, and health educators.

Health educators are professional communication specialists who develop, implement, coordinate, and evaluate instructional programs and other educational events that promote wellness, healthful behavior, and disease prevention. Their messages are usually tailored to address a health issue relevant to an identified subset of their community's members. Health educators can be employed in a variety of contexts, including schools, healthcare facilities, community centers, corporations, or non-profit, health-issue organizations, such as the March of Dimes. This research focuses on public health educators, who are employed by public health departments, to serve members of their local communities.

As front-line disseminators of health information that has been deemed by medical authorities as important for the public to know about, public health educators

bear a heavy responsibility to perform their jobs effectively, given that some of these health messages can have life-changing implications for their recipients (Bensley, 2003).. For example, public health educators are key purveyors of the important health message that an expectant mother should consume appropriate levels of folic acid during her pregnancy, in order to prevent improper neural tube development in the fetus. In addition to their role as information disseminators, public health educators sometimes serve as an initial point of contact for the health care system for many community members, particularly those with a low socioeconomic status or those who lack health insurance. For some of society's members most in need of health information, a public health educator's free outreach event may represent that person's only opportunity to pose a health-related question, or to seek a referral to whatever low-cost health care is available to him. In this way, public health educators serve as two-way conduits for health communication, in that they facilitate both top-down flow of health information from health authorities to the public, as well as the fielding of ad-hoc questions from the public back toward the sanctioned authorities of the body of health knowledge.

With information ostensibly being such a prominent component of public health educators' work, this study examines their work from the perspective of their information behavior – the nature of their information needs, the information-seeking actions they tend to engage in, and their use of information and various kinds of information resources. The information behavior of public health educators has received almost no scholarly attention, despite the important and far-reaching implications for the public of the quality, appropriateness, and timeliness of the health information that health

educators provide. In light of this gap in the scholarly literature, regarding a topic of interest and value to the disciplines of information science and public health, this research study explores the activities and attitudes of public health educators from the perspective of their information-related behavior. The study addresses the fundamental question of “How do public health educators find out what they need to know for their work?” Later in this chapter, this question is expanded into the series of more developed research questions, which targeted five separate relevant topic areas. In Chapter Three, these research questions are expressed as a series of hypotheses, and operationalized into variables supported by specific questions and items on the survey instrument.

Because public health educators can be found working in all 50 states and almost all of the world’s countries, it was necessary to limit the scope of this study to a manageable and accessible subset of their total worldwide population. This study focuses on public health educators working in the region of the United States known as Appalachia. Appalachia was chosen as a delimiting concept for the project, because it is a clearly defined area, and because its socioeconomic and cultural issues establish it as a particularly challenging work environment for health professionals of all kinds (Blakeney, 2005), including public health educators. Because Appalachia is a hotbed of health challenges, and contains many communities that especially need the benefits of health educators’ outreach efforts, it was chosen as the geographical setting for this research.

Health educators working in Appalachia are situated in an active environment for their work, a circumstance that helps to highlight whatever interactions they may have

with information. The basis for terming the region an “active environment” for a profession aimed at promoting health and preventing disease and premature mortality lies in the fact that the health status of Appalachia as a region is generally below the national average. Behringer and Friedell (2006) note that from a demographic standpoint, Appalachia is poorer, less educated, more isolated, and also underserved in terms of healthcare and health insurance, in comparison with the rest of the nation. These are all conditions which have contributed to Appalachia’s poor health status, as evidenced by the fact that rates of tobacco use, cancer, heart disease, general mortality, and premature death are all higher for Appalachia than for the rest of the nation (Behringer & Friedell, 2006). It follows that health educators who must contend with all of these intense health challenges, are likely to be actively involved in a variety of activities characteristic of their profession, which in turn creates opportunities for them to interact with information, in support of those activities.

The above paragraphs note the methodological reasons why Appalachia was chosen as the setting for this study of health educators’ information behavior. However, an additional reason stems from the researcher’s personal interest in this region, from a cultural and historical perspective as well. As a resident of an Appalachian county for more than eight years, she has experienced some natural beauty and almost mystical allure of the mountains, which drew so many of her Scot-Irish ancestors to migrate and settle there in the early days of our nation. Having learned about the history of environmental exploitation and economic disparity inflicted on the region in the past, the effects of which are still seen today in the high poverty rates for many counties, the



development of its resilient and unique subculture is especially fascinating. In addition, the researcher has a special concern about the deleterious impact of the latest economic scourge to plague Appalachia – the abuse of prescription opiate medications such as oxycontin and hydrocodone – a phenomenon for which incidence rates in Appalachia are substantially higher than the rest of the nation, and which substantially impacts adolescent health in the region (NORC, 2008).

In separate sections below, each of the concepts introduced here are defined and described in greater detail, to enhance the reader's understanding of the setting and significance of this study. The first section paints a more in-depth picture of public health educators, including more details about their work activities, their educational requirements, and their professional standards and practices. The second section refines the concept of Appalachia as a geographic boundary for the scope of the study. Widely held conceptualizations of Appalachia are likely to include thoughts of tarpaper shacks perched on remote mountain overlooks, and inhabited by “hillbillies” and coal miners (Harkins, 2004). In reality, Appalachia is a multi-dimensional region (Williams, 2002) that includes images such as this in portions of its “core”, while also encompassing the skyscrapers and intense urban life of Pittsburgh, Pennsylvania. A third section below expands on the prominence of information in the work of health educators, and why it is therefore important to study their information behavior.

### *What is a Public Health Educator?*

This section presents a comprehensive description of the full range of professional responsibilities that public health educators may be called upon to accomplish. Several of the specific tasks that will be mentioned are part of the usual work duties for any type of health educator, including public health educators. Conversely, not all public health educators are involved with the full range of activities that will be described here, because some specific positions call for more task specialization, particularly in larger departments employing multiple health educators (Johnson, Glascoff, Lovelace, Bibeau, & Tyler, 2005).

In terms of a basic job description, the U.S. Bureau of Labor Statistics (2001) offers this Standard Occupational Classification for the job title “Health Educators”:

Promote, maintain, and improve individual and community health by assisting individuals and communities to adopt healthy behaviors. Collect and analyze data to identify community needs prior to planning, implementing, monitoring, and evaluating programs designed to encourage healthy lifestyles, policies and environments. May also serve as a resource to assist individuals, other professionals, or the community, and may administer fiscal resources for health education programs.

This BLS description is accurate regarding the portion of health educator activities that it addresses, but it is too vague and general to provide a realistic picture of the full scope of their work. Teixeira’s (2007) explanation can help to add depth and

color to the BLS' use of concepts like promoting health, assisting communities, and serving as a resource. She notes that health educators engage in assessment, planning, implementation, and evaluation of educational programs of various types, in order to pointedly address a health issue that is pertinent to particular groups of people within their communities. In this description, assessment refers to identifying the health issue, and determining the appropriate methods for addressing it. Planning includes choosing the style of presentation or event that matches the audience's needs, and collaborating with appropriate experts on the health issue. Implementation involves the actual production of the program, including securing grant funding, community support and participation, creating materials, and scheduling facilities or guest speakers. Evaluation refers to the fact that health educators have an obligation to assess the effectiveness of the programs they present, to identify evidence-based effects and benefits from their efforts. In addition, health educators who work for public health departments often serve on local, state, or even national committees or health councils that study health issues (Teixeira, 2007).

A truly comprehensive description of what health educators do should encompass both the duties and activities that health educators are expected to perform, while also discussing the skills that are required to do so. This level of description is provided by the National Commission for Health Education Credentialing, Inc. (NCHEC), the professional organization that develops and maintains professional certifications, professional development, and standards for professional preparation and practice for health educators. The NCHEC description is presented as a tri-level framework, with

seven Areas of Responsibility, each of which has between four and seven Competencies associated with it, and then one to seven Sub-competencies beneath that. The Competency and Sub-competency items serve to elaborate on and “operationalize” the Responsibilities, by enumerating specific skills that comprise each area (National Commission for Health Education Credentialing, Inc.[NCHEC], 2008).

In the following discussion, each Area of Responsibility is expressly stated, and its competencies are generally described in a narrative form in the relevant subsections below. This discussion will be limited to the sub-competencies associated with the “Entry” or basic level, rather than the “Advanced” level of health educator prowess, except where specifically indicated. The Entry-level subcompetencies give a picture of the more typical activities of a health educator, while the Advanced subcompetencies tend to describe more abstract levels of skill or training, such as predicting the effects of sociopolitical forces or societal trends on particular subcompetencies. (The complete framework for the Seven Areas of Responsibility and the Competencies is provided in Appendix A.)

*Responsibility I: Assess Individual and Community Needs for Health Education*

In the historic 1988 report by the Institute of Medicine, *The Future of Public Health*, which has served as the blueprint for the current practice of public health in the United States, Assessment is one of the three common core functions of local public health departments (LHDs), along with Assurance and Policy Development. As a public health practice, assessment is formally defined as the regular, systematic collection, analysis, and reporting of data and information on a community’s health status and health needs, as well as epidemiological and research studies on identified health problems

(Institute of Medicine Committee for the Study of the Future of Public Health [IOM], 1988). For health educators, assessment involves a systematic evaluation of the health, wellness, and disease status of the communities that they serve, in order to obtain scientifically-sound evidence for determining on what health issues they should focus their disease prevention and health promotion efforts. Health educators focus on health issues that can be either improved or prevented through the efforts of individuals to adopt healthful practices and beneficial lifestyle choices. In contrast, other public health professionals such as epidemiologists or water quality scientists would also engage in assessment, but their efforts would be focused on issues that might require government action for resolution, such as a vaccination program or environmental cleanup efforts.

This Area of Responsibility is expressed using six specific Competencies, which address health educators' interactions with health-related data and information, their understanding of people's health-related learning and behavior, and the health educators' abilities to use data to prioritize their health education activities. As part of assessing their community's needs, health educators must be able to discern what factors are present that affect the health-related behaviors of community members, and whether those behaviors promote or diminish health. Simultaneously, health educators also need to assess the availability and adequacy of existing health education services, and their supporting healthcare services, in their communities.

Three of the competencies listed under the "Assessment" Area of Responsibility directly address information-related behavior of health educators, and therefore have especially great significance for this discussion. NCHEC specifies that health educators

must be able to “access existing health-related data”, “collect health-related data”, and “infer needs for health education” from assessment data they have obtained. The specific process of accessing existing health information sources is divided into four subcompetencies, involving the identification and use of a variety of health related databases and computerized information, judging the compatibility of results from different sources, and limiting the search to “valid” sources. These subcompetencies are all listed as entry-level skills; interestingly, this framework classifies the ability to *critique* the quality of health information sources as an “Advanced” subcompetency.

In addition to using existing health-information sources, health educators are also expected to collect original data related to their community assessment duties, using surveys or other appropriate techniques, conducting formal health needs assessments, and estimating areas of potential improvement of the general community’s and its individuals’ health status. The final competency related to assessment specifies the ability to analyze the assessment data as a whole, and draw conclusions about what the data imply about the community’s need for particular health education-based solutions.

It is notable that even these entry-level items cover a variety of very high-level skills, including finding, synthesizing, and evaluating health information and statistical data, conducting research using multiple methods, applying the assessment results to make decisions about resource availability and use, and understanding and applying knowledge of the behavioral determinants of health status. Behavioral determinants of health refer to either risk factors or protective factors that arise from the choices made or actions taken by an individual, and how they affect the probability that the individual will

experience the resulting negative or positive health outcomes (Last & McGinnis, 2003). An example of a positive behavioral determinant of health would be engaging in regular exercise, while an example of a negative behavioral determinant of health would be smoking.

In addition to simply describing some of the activities in which health educators engage, the presence within this framework of competencies and subcompetencies that directly address accessing health related databases and information sources, evaluating the sources, and then applying that information to their work, lends support to this study's assumption that health educators do engage in information-related activities and behaviors which deserve to be studied and understood.

*Responsibility II: Plan Health Education Strategies, Interventions and Programs*

This "Planning" Area of Responsibility covers the activities involved in developing and/or preparing to launch health education programs, campaigns, literature, or other message-dissemination techniques. The seven Competencies falling in this area involve coalition building, integrating the current program with past efforts, setting appropriate and measurable goals, defining the scope of the program and the proper sequence of events, designing and creating the program content, strategic decision-making, and identification of available resources and potential obstacles. In order for health education programs to be successful, health educators need to establish coalitions of involved community members or collaborative partners such as health professionals and health-related organizations, as well as opinion leaders and influential members of the population groups targeted by the planned program. This community buy-in extends both to resource providers already involved in health care, but also to the people who are

part of the intended audience for the program. Especially when there is resistance to the message of the program, it is important for health educators to reach out to the “gatekeepers” within the community’s at-risk populations, who can effectively sanction the event and encourage others to attend.

In this “Planning” Area of Responsibility, information once again plays a direct supporting role for two Competencies. The NCHEC framework specifies as a Competency that a health educator must determine the appropriate scope and sequence of events for the planned health education event or program. The corresponding entry-level subcompetencies specify that the health educator needs to determine a range of health information sources that will be needed to support the event or program, and then select specific references that pertain to that particular program or health issue being addressed. Another competency in this Planning area is the assessment of any factors that will affect the program’s implementation; an entry-level subcompetency specifies the ability of a health educator to identify the available information sources required for delivery of the program to a particular target audience. Again, health educators’ activities and skills are expected to encompass finding and selecting appropriate information sources to support a health-related program, and they even extend to judging the information sources’ appropriateness for a particular audience.

*Responsibility III: Implement Strategies, Interventions, & Programs*

The NCHEC framework lists three entry-level competencies in support of the “Implementation” area of responsibility for health educators. This area pertains to skills and activities for putting the planned strategies, interventions, and education programs into action. The competencies for this area prescribe the use of a variety of skills and



methods to initiate the planned actions for the delivery and implementation of the programs, strategies and interventions. As preliminary steps for the implementation, health educators can employ educational technologies or focus groups effectively. They engage in community organization strategies to involve key people and resources in advance, in order to maximize “buy-in” by opinion leaders of the population groups targeted by the programs to be implemented. Community organization methods also allow for the maximum mobilization and support by strategic partners, such as healthcare providers, social services, and churches. Early initiation activities can also include knowledge or attitudinal pretesting of the targeted population, so that post-program retesting can be used to assess the effectiveness of the program or intervention.

To illustrate the range of skills health educators are expected to employ in implementing their programs and activities, the NCHEC framework states that they will conduct their practice in accordance with the formal Code of Ethics for the profession, as well as demonstrating a high level of intercultural competency and sensitivity, and employing their knowledge of relevant theories and conceptual models from the disciplines of public health, communication, and education. In short, health educators are expected to be successful agents of change, in setting the stage for altering the health status of their communities and targeted populations.

*Responsibility IV: Conduct Evaluation & Research Related to Health Education*

This area of responsibility underlines the prominence of program evaluation and research skills in the work of health educators. The competencies and subcompetencies for this area address planning, designing, and executing research and assessment studies, interpreting the results, and applying the findings to improving existing programs and

creating more effective new programs in the future. The concept of “research skills” used here is further explicated by certain subcompetencies as collecting and analyzing data for assessment of some measure of the health status of a community, or a particular population. This area of responsibility therefore works in concert with the first area of responsibility (needs assessment).

Evaluating the effectiveness of health education programs has become an imperative for health educators. Accountability to government and private funding agencies, and the profession’s commitment to program quality assurance mandates the comprehensive, timely, and objective evaluation of health education programs. Effective evaluations should be conducted both in the early stages of a program (to obtain feedback for fine-tuning the program), and at its conclusion (to determine how well it has achieved its goals) (Breckon, 1997).

Like the Assessment and Planning areas of responsibility, this Evaluation area expressly identifies a way in which health educators are expected to interact with information. The first Competency listed in the framework for the Evaluation area is developing a plan for evaluation and research, and its two entry-level subcompetencies call for health educators to consult the scholarly literature. Health educators are stipulated to have the ability to synthesize information from relevant scholarly literature in support of their efforts to develop plans for program evaluation or data collection. They are also called upon to use scholarly literature to evaluate alternative research designs and methods, and to evaluate the findings from published research. Both of these are clearly components of information behavior.

*Responsibility V: Administer Strategies, Interventions, and Programs*

This area of responsibility for health educators describes the administrative functions they assume, in bringing their programs and strategies to fruition. The competencies for this area highlight the executive functions of the health educator as the manager of a program: exhibiting leadership, obtaining funding, managing human resources, and building public interest and professional support for the programs. Administrative activities for health educators include inspiring cooperation among and coordinating participation by the various kinds of personnel who are involved in a program, coordinating volunteer workers for events (such as off-duty nurses to staff a health fair), managing the project's budget, and exploiting publicity and media exposure for programs or other events.

*Responsibility VI: Serve as a Health Education Resource Person*

Of the seven Areas of Responsibility, this one falls completely within the realm of information behavior. This list of competencies and subcompetencies echoes the activities of a reference librarian: selecting appropriate and relevant health information resources to match identified information needs, using electronic information resources, fielding requests for health information and directing the requesters to the appropriate source, evaluating and acquiring educational materials from various sources, that are appropriate for a particular audience, and serving as a liaison between individuals or community groups, and healthcare providers.

The NCHEC framework reflects the fact that health educators will be fielding requests for health information from community members, often by telephone, requiring the health educators to locate appropriate, valid sources and either provide the requestors

with the information or refer them to an information source. In addition, health educators routinely distribute pamphlets and fact sheets to attendees at their programs and events, to support or extend the content of the presentation. Some of this supporting information is supplied by other organizations, such as the Centers for Disease Control & Prevention (CDC), while some of it is assembled and produced by the health educator as part of delivering the program. In either case, the health educator is performing an information-related task. For the pre-supplied health pamphlets and material, the health educator must determine if the language, reading level, and content is appropriate for distribution to the audience targeted by the program or presentation. When a health educator creates the pamphlets or fact sheets to distribute during a program, he or she must consult other information sources, and compile or synthesize content, and then present it at an appropriate level of complexity and literacy for the intended audience.

*Responsibility VII: Communicate and Advocate for Health and Health Education*

The seventh and final area of responsibility covers a variety of communication skills, plus the support of the profession and its future, and advocating for policy. To discern the current and future trends in health education, health educators need to be able to analyze sociocultural and political factors and their impact on policy makers, and also perceive the implications of consumer health messages originating from healthcare providers and authorities. Focusing on the individual perspective, this area also contains seven entry-level subcompetencies enumerating communication-related abilities to make health educators more effective both in performing their work, and in promoting the profession. Communication-related activities for health educators involve judging the

language used in health education messages, responding to the public's feedback on health information, and choosing between methods (channels) of distributing health information. Proper communication of health information is explicated by the remaining subcompetencies, consisting of proficiency in oral, electronic, and written forms of communication, and that all forms of communication and messages will be culturally sensitive, reflecting cultural competence as another .

One limitation of using the NCHEC outline as a portrait of a health educator's activities is that it conflates both the actual and the ideal of their professional lives. In functioning as a standard and guideline for health educator practice, many of its components are actually goals for the profession to aim for, implying that individual practitioners probably will exhibit varying levels of fulfillment of a particular responsibility and its competencies.

#### *Education, Training, and Credentials*

In the U.S., many health professionals, such as physicians or nurses, are bound by licensure requirements that go beyond their academic training, in order to practice. For health educators, there are both educational degrees and certification procedures available to attest to their professional competency, but possessing these credentials is not necessarily a requirement for becoming a practicing health educator. The possession of these kinds of credentials is not exclusively mandated as in the case of a nursing license, for example, but is instead supported in a less formal way through the specifications of job offerings and the encouragement of professional organizations. In general, a fully-credentialed health educator should hold an undergraduate or graduate degree in one of the related fields (Health Education, Health Promotion, or one of the other variant titles),

and a professional Certified Health Education Specialist (CHES) certification, attesting to his or her ability to deliver accurate health information in a competent and effective manner (NCHEC, 2007).

The CHES certification can be earned by qualified applicants, by passing an examination. The CHES examination is administered twice a year at specified testing sites across the United States. The paper-based exam consists of 150 multiple-choice questions covering material related to the Areas of Responsibility. CHES certification is conferred upon qualified individuals who earn a passing score on the exam. Academic training is the foundation for determining an individual's eligibility for taking the certification examination and for acquiring the necessary knowledge base for professional practice, as reflected in the Areas of Responsibility, the standards for the certification. To be eligible to sit for the CHES credentialing examination, an individual must possess a degree (bachelor's, master's, or doctoral) from an accredited college or university, supported by a transcript demonstrating that he or she majored in health education, including earning a C or better in at least 25 semester hours of course work that clearly addresses the Areas of Responsibility and its competencies.

NCHEC recognizes that degree programs in "health education" can be identified by a range of more specific or alternative terms, such as "Public Health Education", "Community Health Education", or "Health Promotion," for example. While CHES certification can be earned by individuals who have a bachelor's degree in some form of health education, another traditional pathway to CHES status is for a health educator to have a bachelor's and/or graduate degree in a field related to health or wellness, and a

graduate degree in Public Health, with health education or promotion as the area of concentration within Public Health. (The Master of Public Health degree is an “umbrella” degree that includes a core public health curriculum, but accommodates a wide variety of specific “tracks” for taking elective classes in particular subject areas, such as epidemiology, environmental safety, nutrition, health education, etc.) There is a wide range of foundational bachelor’s degrees that can be acceptable (and useful!) for achieving certified health educator status, such as Nutrition, Exercise Science, Behavioral Science, Education, or various life sciences, to name only a few. However, the key for achieving eligibility to take the CHES exam is that at least one of the degrees must involve a substantial component of health education and promotion curricula. For example, a person might have an undergraduate degree in nursing, and a Master of Public Health (MPH) with a concentration in epidemiology, and be judged as ineligible to take the CHES exam, because he lacks a sufficient knowledge base in health education techniques. In recognition of the plethora of actual pathways to becoming a health educator, NCHEC has a process by which prospective health educators can determine their eligibility for taking the CHES exam by submitting degree transcripts with course listings, which are then evaluated by NCHEC personnel as to whether the person has sufficient academic training in health education and promotion to sit for the exam.

The next phase of certification for health educators is currently being established by NCHEC, through the introduction of a more advanced level of testing and certification, called the Master Certified Health Education Specialist (MCHES) credential. This certification would be available for CHES certified health educators who

have sufficient experience and/or academic training, to be assessed on their mastery of the Advanced Sub-competencies listed in the Areas of Responsibility. This level of credential is still being phased into practice; pending the approval of the NCHEC Board of Commissioners, the first MCHES examination is slated to be offered in October of 2011.

The ultimate professional importance of holding a CHES certification still remains in the hands of the prospective employers of health educators; as more job offerings list CHES certification as either required or preferred, then the formalization of health educator credentials and academic training is further supported. In the current absence of licensure, if a director of a local health department determines that a former high school health and nutrition teacher is qualified to manage a new program promoting the benefits of healthful eating and regular exercise aimed at the teenagers in her county, then she is free to construct a job description that allows more leeway in its hiring specifications. Given the potential for great variation in the training and backgrounds of health educators, demographic measures for this study identify the academic fields of study and credentials possessed by Appalachian health educators, and explore their effects on the information behavior of this population.

### *What is Appalachia?*

In addition to the dimension of occupation, the population targeted by this study is also defined by a geographical dimension: the public health educators must be employed by public health departments located in Appalachia. Unlike the boundaries of states or



counties, the limits of “Appalachia” are a more ambiguous construct, and can be defined in different ways according to the definer’s purpose or point of view. However, the most consistently constructed and used definition is that established by the Appalachian Regional Commission, which was used for this study.

#### *Appalachian Regional Commission*

The Appalachian Regional Commission (ARC) is an agency for economic development and social welfare advocacy, consisting of a formal partnership of the federal, state, and local governments in a legislatively-defined proximity to the Appalachian mountain range in the eastern United States. The ARC was formed by Congress in 1965 through the Appalachian Regional Development Act (ARDA), codified as PL 89-4. This legislation was implemented in response to three antecedent factors: documented economic need, the collective political will of regional state governors, and a growing public awareness. In the 1950s, there were serious indicators of economic malaise in the Appalachian region, including a 33% poverty rate, low per capita income, high unemployment, and a substantial migration of Appalachians to other areas of the country, in search of jobs. In 1960, in response to these conditions, the governors of 13 states in the region banded together as the Conference of Appalachian Governors, to collectively address the economic issues and secure federal help in coping with them. Their efforts found a sympathetic champion in President Kennedy, who created the President’s Appalachian Regional Commission (PARC) in 1963, and charged it with the creation of a comprehensive economic development program for Appalachia. President Johnson continued federal level interest in the project, which became the foundation for the 1965 ARDA legislation (Appalachian Regional Commission [ARC], 2010). ARDA’s

success, and bipartisan support, was also boosted by the 1962 publication of a popular book by Harry Caudill, *Night Comes to the Cumberland: A Biography of a Depressed Area*. The author, an Appalachian native and ex-state legislator from Kentucky, painted a vivid picture of the blighting of Eastern Kentucky's coal and timber areas by unfettered industrialism, and the resultant poverty and misery suffered by its inhabitants. Caudill called for the establishment of a Southern Mountain Authority, patterned after the Tennessee Valley Authority, to administer economic development and resource conservation policies, not just for eastern Kentucky, but also for similar areas throughout Appalachia (Caudill, 1962).

According to the ARC's boundary definitions (ARC, 2010), Appalachia is a region most prominently indicated by the backbone of the Appalachian Mountain range, extending for more than 1,000 miles and encompassing 205,000 square miles of land. It includes West Virginia in its entirety, and portions of 12 other states: New York, Pennsylvania, Ohio, Maryland, Virginia, Kentucky, Tennessee, North Carolina, South Carolina, Georgia, Alabama, and Mississippi. The portion of a state that is included in Appalachia is expressed at a county level; across all 13 states, there are a total of 420 counties designated as Appalachian. Almost 25 million people live in this region, and more than 40% of them are living in a rural area, more than twice the rate for the overall U.S. population.

The ARC designation of a county as Appalachian also includes its classification into one of five economic categories, which are used to monitor changes in the county's economic status, as a result of both external factors and the effects of ARC programs.

The classification criterion is an index value based on three economic indicators, which is then compared with nation-wide county-level data, to determine how each Appalachian county stacks up against a national average. The construction of the ARC economic index is explained in detail in Chapter Three. A full listing of all Appalachian counties and their ARC economic classification, arranged by state, is provided in Appendix B.

#### *Alternative Definitions of Appalachia*

In some academic studies, Appalachia has been defined by dimensions other than geographic, such as cultural, political, economic or historical criteria (Raitz & Ulack, 1991). For researchers who are focusing on cultural practices or what it means to be an Appalachian person, geographic criteria alone may be inadequate either to sufficiently focus or necessarily broaden the scope of their inquiry. For example, Keefe (2005b) points out that defining Appalachia only as a region is a problem for researchers studying Appalachian people or culture, because it omits Appalachian natives who have migrated out to other regions to obtain employment. However, for this study, a regional definition of Appalachia, rather than a more nebulous culturally-defined one, is most appropriate, given its focus on health educators' work, because similar regional criteria are used to define the areas of control and responsibility delegated to the public health departments for which the health educators work. Public health departments are generally administered at a county level, or if their jurisdiction is defined as a district or regional level, they represent an amalgamation of specific counties. In addition, epidemiological data about the health status of individuals or groups are also routinely reported in accordance with these same geographic designations (e.g., [www.countyhealthrankings.org](http://www.countyhealthrankings.org)). The data about health status (such as disease prevalence, or the incidence

level of specified health conditions) are used by health educators and other public health professionals to assess the need for implementing particular kinds of actions or programs, and to evaluate the success level of existing or past programs. Therefore, because the jurisdiction, activities, and performance of public health department workers, including health educators, are framed on a geographically-defined model, it is logical that this study of health educators reflects this same structure in defining the geographical parameters of the study.

In setting defining boundaries for his widely-referenced history of Appalachia, John Alexander Williams (2002) uses the ARC definition, then emphasizes in his discussion a core portion of Appalachia that touches on six of the 13 ARC states: West Virginia, Virginia, North Carolina, Kentucky, Tennessee, and Georgia. The implication is that the ARC-designated counties in these states are the most intrinsically “Appalachian” in their manifestation of the definitive characteristics of the concept. Because Williams’ focus is historical, his discussion of Appalachia naturally centers on the portions of the region which were the locations for specific phenomena and events. In contrast, this health educator study uses the full ARC definition to set the geographic parameters for the population, for the reasons described above, while including as part of its analysis an exploration of what the implications of a county’s economic status are for its public health educator(s).

#### *The Importance of Information for Health Educators*

Public health educators are communicators of information content, and the quality of that content carries important implications for the value of their work and for the

health outcomes of the community members they serve. Along with more seemingly mundane topics such as promoting hand washing or dental hygiene, public health educators routinely address such topics as cardiovascular disease, cancer, domestic violence, and mental health. The accuracy and timeliness of the health information that public health educators impart can literally have life or death consequences for its recipients. In fact, even the mundane can have great significance; frequent hand washing has been identified as one of the first lines of defense against potentially lethal seasonal influenza (Centers for Disease Control and Prevention [CDC], 2009). Given this level of importance of their work, this study serves as an initial step in describing how public health educators inform their professional activities, from the perspective of a key concept in information science: information behavior.

First, it is helpful to set the context of information in public health practice in general. The information environment surrounding the practice of public health is especially challenging. Public health activities routinely bring together a wide range of professionals from different fields to address their common goals: assessment, policy development, and assurance (Department of Health and Human Services [HHS], 1999). “Assessment” refers to monitoring community health, and epidemiology. “Policy development” also includes coalition building among various community stakeholders, and health education and advocacy activities. “Assurance” covers enforcement of laws for environmental and food safety, program evaluation, health workforce certification, and the provision of primary healthcare services, primarily to populations underserved by the healthcare industry (Scutchfield & Keck, 2003). This task-oriented interdisciplinarity

results in information needs that span fields as diverse as epidemiology, public safety, law enforcement, mental health, psychology, and environmental toxicology, among others. Finding needed and often time-sensitive information under these circumstances is daunting even for expert searchers (Alpi, 2005).

Addressing the information needs of public health professionals in general has been recognized as a priority activity by governing bodies in both public health and librarianship. For example, in 1998, the Centers for Disease Control and Prevention (CDC) and the National Library of Medicine (NLM) created the Partners in Information Access for the Public Health Workforce initiative, to collaborate in identifying and meeting the information resources and infrastructure needs of public health professionals (Partners in Information Access for the Public Health Workforce ([PhPartners], 2007). One of the collaboration's outreach efforts supported 27 local projects to meet particular needs, such as information technology training, hardware support, document delivery, current awareness services, or website creation (Humphreys, 1998). A subsequent debriefing of the leaders of these projects established that a successful outreach requires an in-depth understanding of the information needs of public health professionals Banks, Ehrman, Cogdill, Selden, & Cahn, 2005).

Given that information has been recognized as an important issue to address for public health practitioners in general, it follows that information access and use also has important implications for health educators. The Partners in Information Access project recognizes health educators as a part of the public health workforce that needs access to quality information sources, because one of its participating organizations is the Society

for Public Health Education (SoPHE), the international professional association for health educators.

One of the most convincing pieces of evidence that information figures prominently in the work of health educators comes from the professional standards of the health educators themselves. As described in detail above, several of the NCHEC Areas of Responsibility include direct references to information-centric activities as being intrinsic parts of the professional practice and abilities of health educators. These professional guidelines state that health educators will be identifying and accessing and synthesizing and evaluating valid sources of health information and databases in order to inform their own activities, such as assessment of health needs, planning programs, and evaluating their effectiveness.

The proper and effective use of information for direct application to their own information needs would probably be sufficient evidence in support of the premise that the information behavior of health educators is worth studying. However, that support is even more thoroughly reinforced by the fact that there is an entire Area of Responsibility (VI) that arguably calls upon a health educator to act almost as if he or she were an information professional, by serving as a “health education resource person.” In this capacity, the health educator is expected to ascertain which information sources, retrieval systems, and databases match particular information needs, in terms of relevancy and validity, and apply these skills to *meeting the information needs of other people*. The health educator is expected to provide others with the needed information, or refer them to an appropriate information source. This area of responsibility also calls for the health

educator to evaluate the appropriateness, for particular audiences, of health resource materials which they have selected or acquired for the purpose of distributing them to community members or event attendees. In addition, the health educator, as part of establishing “consulting relationships” (under this same area of responsibility), is also expected to connect community members with appropriate health care providers or consumer groups or other organizations, which then effectively become interpersonal sources of information for the community members. It seems arguable that, since health educators are being asked, by the practice standards of the profession, to engage in surrogate information seeking and referral in behalf of the information needs of the community members that they serve, it is even more important to study and understand the health educators’ information behavior. Information seeking and use, in behalf of another person, in the context of sanctioned professional practice, and in an area as important as health, would seem to impose a special duty of care upon the health educators concerning this particular area of responsibility, and a shared obligation for information science to recognize public health educators in Appalachia as an important constituency to serve, and therefore to understand and assist them as much as possible.

#### *Research Questions Explored by the Study*

This study is guided by one fundamental question: how do public health educators working in Appalachia find out what they need to know? The goal of this research is to take the initial steps required to understand the processes and activities, if any, that public health educators engage in when they recognize that they, or someone they serve, have what information science terms an “information need.” Information



science uses the umbrella term “information behavior” to envelop the triad aspects that generally describe the result when someone becomes aware of a gap in his knowledge: awareness of an information need, which then prompts information seeking, resulting in information use. To truly understand this phenomenon, the research aimed to first examine information behavior from the perspective of the health educators themselves, to begin to explore what the concept of “information” means to public health educators, and to understand what, if any, role they believe information plays in their work.

This study’s findings enhance the understanding of the processes and perceptions of public health educators regarding the information-related parts of their work. They also evaluate their satisfaction level with the information technology, information-related skills training, and information resources they currently have access to, while not being content to assume that information technology adoption and use is an evolutionary progression, or a sufficient indicator that their information needs are being met. The purpose of this study is definitely not to impose a diagnostic test to assess the public health educator practitioners, in terms of their information technology use or information seeking prowess. Instead, the goal is a fundamental understanding of the existing relationship between Appalachian public health educators and information, with an eye towards what the discipline of information science can offer to theirs, while emphasizing how any help they might need from information science can be integrated into their existing work processes and activities, through a beneficial, symbiotic partnership. This study is intended to be a first and basic step toward resolving the questions of how health educators conceptualize information, and envision it in their professional activities.

To expand upon and develop the broad question posed above (how do public health educators working in Appalachia find out what they need to know?), this study was guided and shaped by five focused research questions, which address the actions, attitudes, and satisfaction levels of this population, and explore any potential effects of a county's socioeconomic status on those same phenomena.

- RQ 1: How do Appalachian public health educators find and use information?
- RQ2: How do Appalachian public health educators perceive their information needs?
- RQ 3: How do Appalachian public health educators perceive their abilities to find and evaluate information?
- RQ 4: How satisfied are Appalachian public health educators with the information resources that are available to them?
- RQ 5: Is the information behavior of Appalachian public health educators affected by whether they are working in economically challenged versus advantaged areas, and if so, how does it vary?

The first four questions underscore that this study was seeking answers from the perspective of the health educators themselves, in focusing on their own description of their activities, their perception of their information needs and their abilities to deal with them, and their personal satisfaction levels with the information resources. Surveys, as tools of understanding phenomena, are often criticized for supplying “self-reported” findings (Alreck & Settle, 2004), but for this study, tapping into the world views of this population is exactly what is needed. It is hoped that this study's findings will serve as a

useful prelude to a subsequent in-depth, qualitative, observational study of health educators interacting with information and information-seekers, in their actual work environment.

## Chapter 2

### Conceptual Foundations, Related Research and Literature Review

This chapter begins with a review of the research literature in several relevant areas, including information behavior and information seeking, both in general, and within the public health context. This review emphasizes the connections between the literature, and the study's purpose and design. The findings from formative research for this project, involving in-depth interviews with two public health educators, which helped to shape the design of this study, will also be described. In addition, the theoretical foundation for this study, the Comprehensive Model of Information Seeking (CMIS) (Johnson, Donohue, Atkin, & Johnson, 1995), will be described, along with the “parent” theories that inspired it: Uses and Gratifications (Katz, Blumler, & Gurevitch, 1974), and the Health Belief Model (Rosenstock, 1974). The chapter concludes with the presentation and explanation of the hypotheses.

#### *Information Behavior*

Information behavior is an umbrella term which covers an array of potential interactions that human beings may have with information, while still being specific enough to concisely express a meaningful concept. This area of library and information science originally was referred to by a more unwieldy phrase: information needs, seeking, and use. In the 1990s, “information behavior” arose as the preferred term for the interrelated phenomena that occur when a person realizes he has a need for information, takes action to locate the information, and then applies it to meeting the need. However,

information behavior both includes, and expands upon the classic three-step view of the process. Information behavior encompasses “how people need, seek, manage, give, and use information in different contexts” (Fisher, Erdelez, & McKechnie, 2005). This definition reflects the contributions of additional theoretical perspectives that identified additional dimensions of the phenomenon, beyond just “need, seeking, and use.” One of these dimensions is the degree of intentionality of the information-seeking behavior; Wilson’s (1999) definition of information behavior is “the totality of human behavior in relation to sources and channels of information, including both active and passive information seeking, and information use.” Passive information behavior includes when information is encountered by accident rather than by design, while active information behavior can even include intentionally avoiding information (Case, 2007).

Information behavior is one of the most prolific research areas in library and information science, as well as being one of the most theory intensive (Pettigrew & McKechnie, 2001). In this general section on the information behavior literature, the discussion will be limited to four widely acclaimed theoretical models: Taylor’s Question Negotiation, Dervin’s Sense-making, Kuhlthau’s Information Search Process, and Ingwersen’s Integrative Framework for Information Seeking and Interactive Information Retrieval (IIR). An overview of these models can provide a sufficient picture of the kinds of processes that take place when people recognize and act upon their information needs.

#### *Taylor’s Question Negotiation*

Robert Taylor (Taylor, 1968) laid the groundwork for many of the subsequent models of information behavior by delving deeply into what happens when a person recognizes and formulates her information need, and then attempts to express it to an

intermediary who has access to information sources. Taylor's model begins with four stages in the process of the person's recognition and expression of their information need in the form of a question. The need begins in a Visceral state, when it is vaguely perceived by the individual but not actually expressed. The need becomes Conscious as it is formulated in the person's brain, then Formalized in a statement. The fourth stage produces a Compromised need, when it is presented to an information system in the form of a question.

Taylor also addresses the "pre-negotiation decisions" that the information seeker engages in, prior to actually submitting the question to an information intermediary such as a librarian. In this pre-negotiation stage, the person can employ a range of options to try to meet the information need himself, such as searching the literature or library resources on his own, or asking other people he knows for an answer, or devising search strategies on his own. Ultimately, the person may then seek the help of an intermediary, at which point the two people become engaged in a negotiation – a sort of meeting of the minds -- to ascertain exactly what the actual information need is and how the sources that the intermediary has access to might meet the need. According to Taylor, the intermediary, often a librarian, runs the question through five distinct filters, in an attempt to fully understand the nature of the person's information need. These filters are: 1) the actual subject of the information need is determined, 2) the actual objective of the seeker, and his motivation for asking, are identified, 3) a judgment is made about relevant personal characteristics of the seeker (such as educational level), 4) the "fit" of the seeker's query with the organizational schema of the information system is considered,

and, 5) the range of acceptable answers or “matches” with information resources, is identified. The impact of Taylor’s Question-Negotiation model is demonstrated in that many other information behavior theorists refer to it, or borrow and adapt portions of it for their own successful models, despite some scholars’ concerns that it is primarily based on anecdote and informal observation rather than rigorous empirical testing (Edwards, 2005).

#### *Dervin’s Sense-making*

Sense-making is a broadly applicable communication theory that states that human behavior is attuned to making sense out of the person’s environment, and experiences that happen to the person. People encounter phenomena that cause them to realize that there is a “gap” in their knowledge or understanding of what is occurring or what they perceive, in their environment. Brenda Dervin presents this gap metaphorically as being like a large hole in the ground that separates the person from reaching an understanding, which is a kind of destination. The person then engages in sense-making behaviors, which include information seeking, in order to “bridge” that gap in their knowledge (Case, 2007). This conceptualization allows for a large number of external factors to influence the sense-making process, including societal-level conditions and constraints, individual factors such as demographic traits or literacy level, and situational factors, such as proximity to a particular kind of information source. In an information-seeking context, this theory seeks to explain the conditions under which information seeking will or will not occur, and what the nature of that information-seeking activity will be. In general, Dervin predicts that if societal-level conditions constrain access to information sources, individual demographics will best predict the kind of information

seeking that will occur. If access to information sources is not constrained at a societal level, then situational factors will be the best predictors (Dervin, 2005).

This theory is identified as a communication theory because that is the domain of its provenance, but the prominent role of information in Sense-making Theory has caused it to become a foundational theory for many information science-based models and conceptualizations (Case, 2007). For example, one of the prominent themes in Dervin's theory is that the information seeker's perspective should be the driving force in the design and evaluation of information systems (Dervin & Nilan, 1986). This emphasis on the person's information need represented a substantial departure from the original focus of information-seeking research in the discipline, which emphasized the characteristics and design of an effective information system.

#### *Kuhlthau's Information Search Process*

Carol Kuhlthau's Information Search Process (ISP) presents a six stage model of information seeking from the seeker's perspective, which represents the findings of over twenty years of empirical research with actual users of libraries and information systems. The ISP model emphasizes that information seeking often takes place in response to a feeling of uncertainty, often accompanied by some degree of anxiety, on the part of an individual, who then engages in a systematic quest to find meaning from the resources contained in a formal information system. The ISP is noted because of its consideration of the emotional state of the information seeker, in addition to the person's thoughts and actions; it was one of the first information-seeking models to give affective elements equal billing with cognitive and behavioral aspects of the phenomenon (Kuhlthau, 2005).



Kuhlthau's conceptualization of information behavior was inspired by the work of psychologist George Kelly's Personal Construct Theory (Kelly, 1963), which asserts that a person constructs his world view in phases by absorbing information that he encounters as he goes about his life activities. This theory emphasizes the various emotional states that can be caused by the introduction of new information, which can result in either rising confusion and anxiety to the point that the information is discarded, or the person can engage in formulating and testing the information hypothetically, to see if it can be integrated into his existing personal constructs (Kuhlthau, 1991).

Kuhlthau envisions information seeking as a series of choices made by the information seeker, which are influenced substantially by four factors: Task (what goal the person is trying to accomplish), Time (how much time is available for coping with her information need), Interest (how involved she is with the goal), and Availability (what information resources are accessible to her) (Kuhlthau, 2005). The six stages of the ISP model are as follows: 1) Initiation is when the person becomes aware of her information need, and often experiences uncertainty and initial apprehension. 2) Selection is when the problem or topic is identified, often creating an initial feeling of optimism as the person starts to get a handle on dealing with her information need. 3) Exploration is when the person is engaged in the search and sorting through various sources, which often seem to conflict or not fit well together, causing her uncertainty, confusion, and doubt to rise. 4) Formulation occurs when the information seeker starts to make meaning out of the information she has found, causing uncertainty to ebb and confidence to rise. 5) Collection is when sources that contribute to the person's growing understanding of the

topic are gathered, causing her interest and involvement in the task to increase, and negative emotions to wane. 6) Finally, Presentation occurs when the search is finished, the information has been assimilated, and the person's understanding of the topic is sufficient to allow her to apply what she has learned, or to communicate her understanding to other people (Kuhlthau, 1991).

The greatest value of the ISP model lies in the fact that it provides librarians and information source providers with an understanding of the experience of users of information systems, and the implications of their affective state for both information system design and the timing of when information professionals should offer their assistance. Kuhlthau asserts that the phases of heightened uncertainty and anxiety constitute Zones of Intervention, when the assistance of a librarian will be most welcome and effective (Kuhlthau, 2005).

#### *Ingwersen and Jarvelin's Integrative Framework*

Peter Ingwersen and his colleague Kalervo Jarvelin have developed the Integrative Framework for Information Seeking and Interactive Information Retrieval (IIR) (Ingwersen & Jarvelin, 2005). This model spans the boundary between the realm of information behavior and that of another major area of interest in information science, information storage and retrieval (IS&R). IS&R traditionally has dealt with the non-human areas of information science, namely the nature of information objects, and the technology that serves to organize and provide access to these objects. However, the IIR is included in this literature review because of its emphasis on the importance of contexts in information seeking.

The IIR model seeks to bridge the separation between information seekers and the information retrieval systems that they use by situating the information seeker in the middle of a “dual contextual frame”; on the one side, is the context of the information technology (including search engines, search algorithms, the information objects and resources, and the user interface). On the other side, the user is immersed in three active contexts: organizational, social, and cultural, and is also affected by his past experiences in information seeking, adding a historical context as well. The IIR model sees all of these contexts as interconnected and constantly influencing each other, creating a dynamic, interactive information-seeking environment, as opposed to more static, “laboratory-based” views of information seeking and retrieval (Ingwersen, 2005).

#### *Connections to Information Behavior Theories and Research*

This review of the literature of information behavior in general has mentioned only a few of the myriad theories, models, and research studies that exist in this bountiful area, while necessarily omitting many notable and significant ones. The four theories/models that were mentioned were selected because they help to set the stage for this study by addressing aspects of information behavior theory that seem particularly useful for understanding the significance of studying the information behavior of public health educators. Dervin’s Sense-making paradigm is essential for understanding the importance of focusing on the individual information-seeker, and what kinds of conditions function to inhibit or encourage their information seeking. Because this proposed study is designed to provide an initial picture of how public health educators

engage in information seeking, or even to what extent they actually do, Sense-making's framework of societal, individual, and situational constraints and incentives for information seeking may offer insight into when and why public health educators engage in information seeking, or forego it.

Taylor's Question-Negotiation theory seems particularly relevant to the study because it provides insights on how information needs are "born" and then dealt with. Among the goals of the proposed study are to learn whether public health educators in Appalachia perceive that they have information needs that warrant information seeking, and which of their activities are more likely to inspire information seeking. Taylor's four stage process of how information needs are recognized and developed into actionable queries may be useful for analyzing the results of measures about the origin and frequency of their information needs. In addition, the portion of Question-Negotiation which addresses how information professionals deal with interpreting user's information queries relates directly to the challenges public health educators might face in fielding ad hoc questions from their community members.

Kuhlthau's Information Search Process is valuable because it is a tested, comprehensive framework of the formal information seeking process, which provides an interpretation of the frustrations or complaints that study respondents express with regard to their own information seeking activities. In addition, the ISP concept of a zone of intervention has particular relevance for when public health educators present information to the public in program presentations, or through other ways of information dissemination. In addition, the zone of intervention concept speaks to the circumstances

and opportunities for information professionals to assist health educators in fulfilling their information needs.

Ingwersen's Integrative Framework is included because it underscores the importance of contexts of all kinds that intervene during any information seeking activity. Health educators who will be participating in this study are operating within multiple contexts, including the unique and defining cultural context of Appalachia, the organizational context of their LHD, and the social contexts of health, rural life, behavioral determinants of health, and the chronic underfunding of public health in general, among others. System-oriented contexts include problems they have with accessing information sources or libraries, or a lack of awareness of resource availability.

#### *Information Behavior As Defined By Occupation*

The most prolific area for research on information-seeking or information behavior is the context of a workplace, with information-seekers being defined by their occupation or work role (Case, 2007). The job titles most frequently targeted by information behavior studies are scientists, engineers, academics, and business managers. These kinds of studies have investigated a wide variety of aspects of information behavior, including use of journals, web resources, and communication technologies such as email, sharing of information with colleagues, techniques of coping with information overload, criteria for evaluating source credibility, and factors affecting preferences for some information sources over others, for example (Case, 2006).

Case (2006) also notes that health care providers of various types, including physicians, nurses, pharmacists, and nurse practitioners, are becoming popular subjects for information behavior research. Unfortunately, this emphasis has not included public health workers in general, and health educators specifically. However, a British study of the information behavior of social workers employed in a hospital setting (Harrison, Hepworth, & deChazal, 2004) may prove to be the “closest cousin” to this study of health educators. This study found that the social workers were lost in an information Catch-22: their professional practice imposed heavy information needs, but they had few means by which to satisfy them. Their jobs frequently required them to make decisions about the care of their clients that required synthesizing an array of information from various sources, including many different health care providers, social agencies, law enforcement personnel, and medical records. They also received regular requests for information from their clients, about medical conditions and available services. However, none of the social workers participating in the study had access to the Internet, and less than half had access to email. Almost none of the participants was familiar with electronic databases such as MEDLINE or CINAHL that would contain articles relevant to their practice; the few who were familiar with the databases had only used them when they were students, but not as part of their professional duties.

Library sources and services provided little relief for the social workers’ information needs because of several barriers to their use. Most of the study participants did not have official access privileges to the library at their hospital, and without Internet access, their ability to use online library resources was limited. A few had found useful

sources at their local public library, but this required them to either leave their workplace during their working hours (which is not feasible for a profession that is expected to be readily available on site as needed) or visit the library on their own time. The study's authors characterized the social workers as being "information poor" and note that their only consistent source of the information needed for their work was face to face communication with other people. The researchers noted that multiple solutions were needed to improve the social workers' information environments, including information and communication technology infrastructure and training, the development of focused information sources on frequently-needed topics, and increased access to and support from on-site library-based resources, including making an information specialist available to the social workers, to find resources, develop and manage a focused collection, and conduct training in the use of information technology.

### *Information and Public Health*

The existing body of scholarly literature exploring information in public health contexts is relatively small, and tends to not specify particular kinds of public health workers, referring instead to a more generic concept of these people. It is important to note that most of these studies have information as a peripheral topic, rather than truly being an Information Behavior study. To date, most attempts to gain insight into the state of these information needs have sought to quantify such concepts as the frequency of use of particular information sources, available electronic information access, unmet information technology needs, and/or self-assessments of information-use competencies. A particularly cogent example is Lee, Giuse, and Sathe's 2003 statewide survey of

Tennessee public health department workers. This study's findings emphasized barriers to using information technology because many public health workers had to share computers, had workflows that did not accommodate online searching, spent their computer time on communicating rather than searching, or made more use of general search engines than focused, trustworthy resources like MEDLINE. This Tennessee study's structure, and ultimately its findings, delivers support for the classic agenda items of applied information science research: increasing the frequency and skillfulness of online resource use, providing user instruction (information technology use training), and creating awareness of how librarians and information professionals can collaborate with clients to meet their information needs (Lee, Giuse, & Sathe, 2003). Other studies of particular kinds of public health professionals (e.g., Wallis, 2006) used similar methods, and came to similar conclusions, tweaked to fit the particular context of the study population.

In the near absence of actual information behavior studies of public health professionals, the closest substitute seems to be studies of training or continuing education needs for the public health workforce. Improvements in training or assessment of training needs for public health workers is a theme that appears in the literature, as part of a longstanding concern that this workforce will not be up to meeting the 21<sup>st</sup> Century performance challenges faced by the discipline. For example, Danielson, Zahniser, & Jarvis (2003) describe a workforce training needs assessment program that was conducted with participants in the Public Health Prevention Service, a program established by the Centers for Disease Control and Prevention, to train Prevention



Specialists how to effectively administer prevention programs, based on identified competencies. However, although the article includes in its rationale for performing the training assessment a quote from the recommendations of a US Public Health Service working group's findings that state that public health workforce competency must include the use of new information technologies (Danielsen, Zahniser, & Jarvis, 2003), the training assessment survey reported on in the article did not mention information technology use skills as a "gap" area in workforce training. The closest reference to information-behavior related skills were two items listed under analytic and epidemiological skills: "uses computer software", and "analyzes scientific literature," but in the survey context, these skills were more about knowing how to use epidemiological software, rather than for information seeking.

A successful training program was described in a case report on a project to provide Internet access and use training for five rural Iowan health departments (Walton & Hasson, 2000). The paper does not mention if any health educators were involved in the training.

On an issue closely related to workforce development and training, Fraser (2003) makes the case for why the public health workforce and especially those working in LHDs need greater standardization of job titles, job responsibilities, and educational and training backgrounds across states and counties, as well as a good inventory of the characteristics of the people currently filling all positions at LHDs across the nation.

In another study, this same issue of job standardization was addressed for LHDs in rural communities only, and found significant discrepancies in the staffing levels of

rural LHDs versus suburban and metropolitan LHDs, except in four occupational classifications, of which two were CHES health educators and health information systems specialists. It is not clear whether this means that staffing levels for CHES health educators are adequate for LHDs in all size communities, or whether there is rampant understaffing of CHES health educators across all community types. However, certified health educators were ranked as one of the top three categories of need, in each of the three community size levels (Hajat, Stewart, & Hayes, 2003).

#### *Information and Health Educators*

A very small number of studies about the skills, abilities and expected competencies of health educators represent the closest facsimile available for research into their information seeking behavior. These studies were conducted as existing workforce assessments, or as evaluations of the relative importance of each of a list of professional core competencies, either from the perspective of potential employers, or from health educators themselves. Most of these “workforce” studies mention information-related competencies only peripherally, if at all.

Echoing the prevalent training-needs theme discussed above for public health workers in general, Price, Akpanudo, Dake, and Telljohann (2004) surveyed a sample of 150 public health educators to determine for which professional competency areas they feel they need continuing education. This study was among the few found that touched even fleetingly on information related activities of public health educators, and shed a glimmer of light on this area of interest. This study used an earlier version of the list of areas of competency rather than the one currently used by NCHEC, but some of the key information-related elements were discernable in the results. This study’s results

indicated that its respondents have a high level of confidence in their ability to “interpret and respond to requests for health information,” as only 5% of respondents indicated that they “need[ed] considerably more training” in this area (representing the bottom two points on a five point scale), while 81% felt they were well-versed in this area (top two scale points, out of five). However, for the other sub-competency directly related to the proposed study’s area, “utilize computerized health information retrieval systems effectively”, 28% indicated that they needed considerably more training in this area, and only 43% felt they were well-versed in this area. This means that well more than half of all respondents felt they could benefit from at least some level of continuing-education training in this fundamental aspect of information behavior.

A similar study was performed to assess the training needs of public health educators in Kentucky (Lindley, Wilson, & Dunn, 2005). This study also emphasized lists of competencies, and ranked the items based on respondents’ reporting of their own proficiency levels, and areas where they believe they need special training more than others. Although in terms of relative ranking, some information-related items were ranked highly on lists of the highest proficiency items, the percent level was still low enough to indicate that a large majority of respondents felt they were less than completely proficient. For example, 41.6% listed themselves as “most often proficient” at “finding health information”, and 35.5% said the same about “explaining health information to community”. This means that approximately 60% of respondents consider themselves to be something less than proficient at these two information-related skills. On a measure of how many respondents wanted training in a particular area, 50% asked for training in

finding health information, 55% wanted training in explaining health information to the community, and 68% wanted training in using the Internet as an educational tool. These findings seem to indicate that, while information-related competencies may not be the areas of highest relative concern regarding proficiency ratings or requests for training, a substantial number of these Kentucky health educators would like to improve their abilities in this area.

A survey of employers of health educators in the San Francisco area (mostly community-based non-profit organizations) found that they were largely content with the skills and abilities of health educators with MPH degrees that they had hired, except that too few were bilingual (Finocchio, Love, & Sanchez, 2003). This study did not include information-related skills as part of the competencies they evaluated.

An earlier workforce study (Allegrante, Moon, Auld, & Gebbie, 2001) took a different approach, by asking a panel of leading health education professionals what competency-related abilities they felt were important areas of concentration for continuing-education efforts and resources. This panel's conclusion listed eight competency areas to be emphasized to meet continuing education needs in the development of the workforce. One of these was "Computing and technology", which included the subcompetencies "Computing literacy", "Distance learning", and "Electronic communications and access to the World Wide Web".

One study took a different approach by attempting to quantify how health educators in North Carolina LHDs spend their total work time hours, in terms of the activities listed in the Areas of Responsibilities (Johnson, Glascoff, et al., 2005).

Elements of the Areas of Responsibility pertaining to information usage were not specifically mentioned, but it was reported that “Acting as a resource person in health education” occupied 10% of these health educators’ worktime. In addition, 10% of the respondents indicated that they did not serve in this capacity at all.

In short, the literature review reveals that the information behavior of health educators has not been sufficiently or directly investigated. Research that is aimed at assessing training or continuing education needs often conflates using computers or software with actual information-seeking activity, so these studies at best can only be loosely associated with the subject of this proposed study. Although Lee, et al. (2003) included “health educator” as one of the public health job categories in their survey on information behavior, they reported by job title only their access-related findings; the rest of their findings about information use aggregated all job titles together, so one cannot discern from their findings what if any information behaviors were unique to health educators. What little research attention they have received has not emphasized the particular information-related tasks and activities that health educators engage in, particularly the situations in which they are exposed to ad hoc information-oriented questions from their community members, not unlike those that might be posed by a lay person to a medical librarian. This study addresses the need to consider the complex information needs public health educators may have to contend with, and the dearth of understanding about how they cope with these situations.

### *Formative Interviews with Health Educators*

As pre-pilot formative research for this proposed project, in-depth interviews with two health educators were conducted in March of 2007. One worked for a public health department, while the other was employed in a university setting. Although there was a lot of overlap in their activities, experiences, and attitudes, the two different work circumstances created different approaches to solving the information issues that typically arose as part of creating new health education programs. In addition to testing the waters regarding the informational aspects of public health educators' work, these formative interviews were also useful for supplying a more vivid picture of the kinds of activities, challenges, and issues that both health educators routinely deal with in their professional lives. The lists of activities that appear in the primary study's survey instrument reflect the common themes of their shared experiences as health educators.

The interview guide for the study (Figure 1) enumerated two distinct stages of the discussion. The first four questions were general prompts to allow the participants to present their views of what is personally meaningful about their work as health educators in general, and when they develop a new education program. This reflected the researcher's assumption that the activity of developing a new program would be more likely to trigger an information need than delivering a premade program would. Additional general questions encouraged each participant to talk about past programs that were particularly memorable to her, and to express what aspects of program development are particularly challenging or satisfying, from her personal perspective. The first four questions in the Interview Guide intentionally did not use the word

“information” or directly mention information sources, in order to see if the health educators would bring up the concept spontaneously. The second half of the question set was designed to directly raise the topic of information and areas in which information behaviors would occur, to focus each participant on what that aspect of her work meant to her. Using this guide in this way, the interviews could then provide a more complete picture of the role of information in the participants’ professional lives, and their attitudes about it. These formative interviews indicated a plethora of information-related questions that were reflected in the instrument for this study of information within the context of the work of public health educators.

- Q1. Tell me about your work as a health educator.
- Q2. Describe the process for developing a new health education program.
- Q3. Tell me about a particular program that stands out in your mind.
- Q4. What is the most satisfying aspect of developing a new program? The most challenging?
- Q5. If you are developing a new program & need more information about the issue, what do you do?
- Q6. What role does the Internet play in your work?
- Q7. What role does the library play in your work?
- Q8. When you field an impromptu question from the public, and don’t know the answer, how do you find out what you need to know?

*Figure 1. Interview Guide*

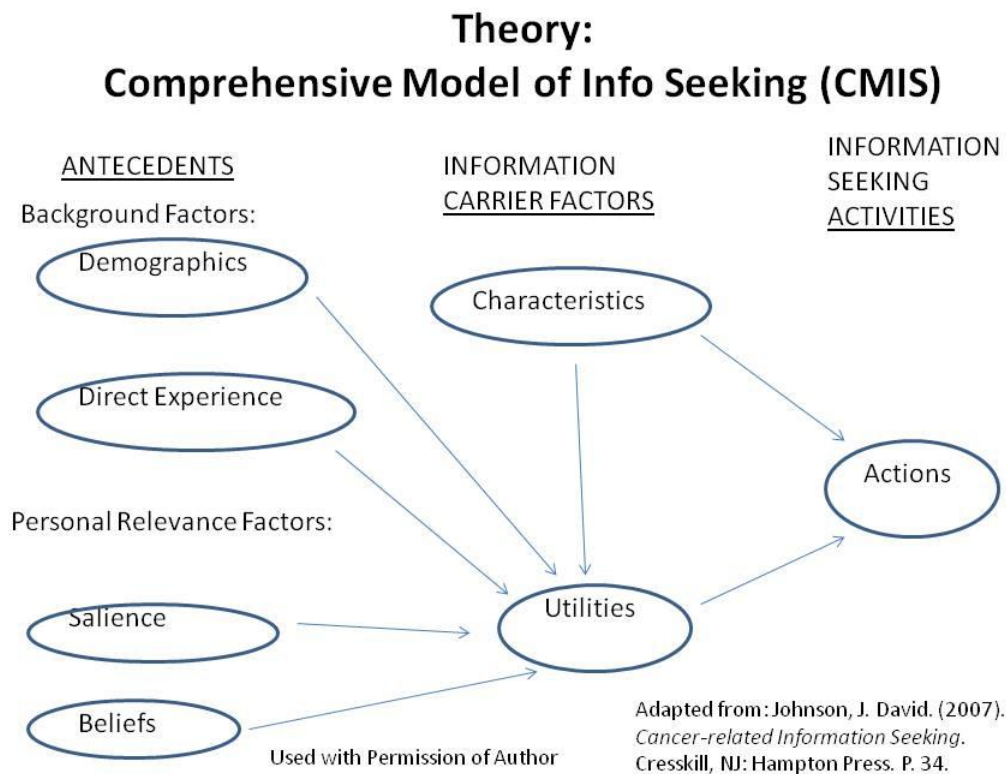
### *Theoretical Foundation for the Study*

#### *Comprehensive Model of Information Seeking*

The guiding theory for the design of this proposed study is the Comprehensive Model of Information Seeking (CMIS), developed by J. David Johnson (Figure 2). The CMIS seeks to provide a better understanding of individuals' information behavior by first examining factors that motivate and influence the person to look for information, then exploring the factors that influence or determine what channels (sources) they select in order to access the information, and then finally to engage in information-seeking actions.

This model has been tested and applied primarily in two contexts: information seeking by members of an organization (Johnson, Donohue, Atkin, & Johnson, 1995), and information seeking by individuals within a health context, such as receiving a diagnosis of cancer (Johnson, 1997), or contemplating genetic testing in order to learn about inherited predispositions for serious diseases (Johnson, Andrews, & Allard, 2001). Information seeking by a public health educator seems to span these two contexts for CMIS, because these health educators are working within the constraints and in their capacity as an employee of an organization – a local public health department – and their information-seeking activities are clearly situated within a health-related context.





*Figure 2. Comprehensive Model of Information Seeking (Adaption)*

The first group of factors in the CMIS are called the Antecedents of information seeking, and are divided into two subgroups: Background factors, and Personal Relevance factors. The Background factors are Demographics and Direct Experience, while the Personal Relevance factors are Salience and Beliefs. Demographics refer to the descriptive personal traits (such as age, gender, and ethnicity) and socioeconomic status of the information seeker. The other Background factor, Direct Experience, incorporates the idea that the information-seeker starts off with some level of knowledge or understanding about the area of interest that is associated with the information need. This could be a very limited amount of understanding or an in-depth knowledge and long-standing body of experience, opposite states that would have a significant impact on how the information-seeking event plays out. Case (2007) notes that this background factor includes the information-seeker's social network of people to whom the person could turn to find an answer or an idea about how to meet the information need.

The other category of Antecedents, the Personal Relevance factors, includes Salience and Beliefs. Salience refers to the fact that the information-seeker perceives that the desired information is both relevant to the information need, and that it is clearly applicable for solving the problem or resolving whatever the issue was that prompted the individual to recognize that the information need existed. The CMIS identifies Salience as perhaps the most important driver in causing a person to initiate information-seeking (Johnson, 1997). Beliefs refer to an array of antecedent factors that center around the individual's world view and perceptions of their abilities and constraints that they face. Self-efficacy (the individual's perception of their potential to create a positive change if

they engage in information seeking and find the answer) and cultural norms (perceived, externally-determined barriers or incentives to information seeking that arise from the person's group identity or organization) are also important parts of personal Beliefs.

Taken together, these four Antecedent factors of information seeking make important contributions to setting the stage for the information seeking process, including determining whether it occurs at all, and, if it does, how extensive or effective it may be. They also exert a strong influence on the next set of factors, which are the two Information Carrier factors: Characteristics and Utilities. Characteristics of the Information Carrier (the channel for the information) include physical attributes, such as involving interpersonal versus mediated communication, or to what extent the channel approximates face to face interaction (Case, 2007). Characteristics also include more abstract or subjective qualities, such as source credibility, comprehensiveness, clarity and style of the messages (Johnson, et al., 1995). The Utilities of the Information Carrier refer to the channel's capacity for matching the individual's information need and satisfying their expectations. Convenience and ease of accessibility are key components of the Utility factor, to the extent that the information-seeker will often select the source that is most readily available, even when they are aware that a more authoritative source is available but requires more effort to use.

The final stage of the CMIS model is Information Seeking Actions, which is the culmination of the motivating effects of the Antecedents and the impact of the choices made in Information Channels. Two important aspects of the Actions taken are their scope and depth. Scope refers to the range and variety of sources (including people) that

the information-seeker chooses to consult, while depth refers to the intensity and thoroughness of the individual's interaction with each source (Johnson, et al., 1995). Case (2007) points out that Johnson sees the context of the information need and seeking as an important determinant of what, if any, information seeking actions are ultimately taken, and that the process modeled by the CMIS is a dynamic one, and suitable as a foundation for empirical research.

The CMIS was selected as an appropriate theoretical guide for this proposed study of health educators' information behavior, because its structure and areas of emphasis match the exploratory nature of this study, given the lack of existing research on the information behavior of this population. In attempting to understand how health educators view the role of information in their work, and what their reasons are for engaging (or not engaging) in information-seeking activities, this study is addressing the Antecedents named in the CMIS. Examples of this are: the level of education of the health educators (a Demographic antecedent), how often they perceive a need to seek additional information in creating or delivering programs, and how comfortable they are doing so (Direct Experience), how frequently each kind of activity they engage in creates an information need for them (Salience), and their self-assessment of their information-seeking ability (Beliefs).

Other portions of the survey instrument are designed to evaluate the respondents' perceptions of Information Carrier Factors, both their Characteristics and Utility. For example, multiple items on the instrument gather responses about electronically mediated versus print sources (Characteristics), while another measure source preferences and

frequency of use of a range of library resources and types (Utilities). Regarding the model's final stage, information-seeking Actions, this study also has the ultimate goal of understanding what health educators actually do about their information needs, which is reflected in the multiple measures and individual survey items exploring the respondents' actual actions they take in dealing with their information needs.

### *Uses and Gratifications Theory*

This is a full-fledged mass communication research paradigm about the reasons why people use specific types of media, that originated in the early days of media research with radio listeners (e.g., Herzog's studies of radio audiences; motivations for listening to quiz shows and daytime serials, conducted in the 1940s). The recognized formal presentation of the theory as Uses and Gratifications is attributed to Katz, Blumler, and Gurevitch (1974), although many scholars have since influenced its continued refinement, and application to other media. For example, Rubin (1983) distinguished between two kinds of television viewers: those who watched for entertainment and passing the time, and those whose viewership was for information seeking rather than escapism.

Uses and Gratifications Theory asserts that users of media actively make choices about which media they want to use, and for what specific purpose, which is based on their expectations about what kind of value or gratification its use will provide to them (such as information or entertainment). This theory portrays the user of media as having a goal, among a range of potential goals, for using that particular medium, in order to satisfy that goal, rather than using the medium out of habit, or because its use is compelled by some sort of irresistible appeal of its messages or entertainment content.

This theory is relevant to the proposed study because one of the prominent potential gratifications expected from media use is becoming informed, or meeting an information need. In addition, the CMIS is acknowledged to have as its foundation, the same set of assumptions about people's use of media as Uses and Gratifications Theory is based on: media use is aimed at a specific goal, that media users initiate a purposeful selection of a particular medium on the basis of their expectations about how it will fulfill their goal, and that there are multiple media channels that could potentially fulfill the user's goal, setting up a competitive situation between the different media (Johnson, et al., 1995).

#### *The Health Belief Model*

The Health Belief Model (Rosenstock, 1974) first arose during the 1950s, when Rosenstock and his colleagues in the U.S. Public Health Service determined that the reason a free tuberculosis screening program was ignored by the public lay in its failure to consider the effects of people's attitudes and beliefs on their health behaviors. This theoretical construct predicts that people will engage in a health-related behavior if: 1) they perceive that they are susceptible to being harmed by the problem, 2) they accept that the problem is serious enough to warrant taking action, 3) they believe that the action will benefit them (by preventing them from being harmed by the threat), and 4) they perceive that they can successfully carry out the required action, despite any perceived barriers to doing so (Bensley, 2003). The original versions of this model were attuned to encouraging people to take preventive actions to ward off disease; with the later addition of self-efficacy, the model could also be used to predict individuals' likelihood of

stopping behaviors that were detrimental to their health (Rosenstock, Strecher, & Becker, 1998).

This venerable health communication theory provided a strong influence on the Antecedent Factors stage of the CMIS, through HBM's seven component constructs (Johnson, et al., 1995). The HBM components are modifying factors (including demographics and socio-psychological barriers), perceived susceptibility to disease, the perceived seriousness of the threat, perceived benefits of doing the behavior, perceived barriers to prevent the individual from instituting the behavior, cues to take preventive action (including health education, awareness of symptoms, and information from the media), and the person's likelihood of taking effective action (self-efficacy). The echo of these themes can be heard in the CMIS' description of antecedent factors such as demographics, salience, and beliefs.

## Chapter 3

### Research Methods

This chapter describes the methods used to conduct the study, and presents and explains the research hypotheses. The methods discussion includes descriptions of the population eligible to participate in the study, the operationalization of the research questions and hypotheses, the mechanics of how the study was put into the field, and the techniques for data analysis. Another section of this chapter describes the procedures that were used for a pilot test of the survey instrument.

#### *Definition of the Population*

Rather than using a sampling strategy to select particular individuals to serve as respondents for the research, this study instead sought to conduct a census of an entire population originally estimated to be approximately 450 people. Therefore, this section instead describes the key characteristics that defined the population of interest, and constitute the criteria for inclusion in the study. After fully defining the population that was eligible to participate in the research, this section then explains why a census was an appropriate approach to use for this project, and then describes how the population frame was constructed.

The population for this study is defined as health educators who are employed by county (or regional, when applicable) public health departments, and are working in areas that are designated as being in Appalachia. This population frame encompasses three dimensions – occupation, workplace, and geographic location – all of which had to be



met in order for a person to qualify as a respondent for the study. Each of these dimensions is more clearly explicated in this section.

The defining criterion for determining if a person is a health educator, and therefore in compliance with the first dimension of the population frame, was that he or she is actively employed as a Health Educator. This attribute was indicated by the person's job title and/or his or her job description. Qualifying respondents were also required to be currently employed as Health Educators; former Health Educators who have retired or changed careers were not eligible. Using such a functional definition of "Health Educator" was most consistent with the purpose of the study, which is to understand the behavior and attitudes of people who are currently engaged in health education activities. As discussed in Chapter 1, the profession leaves room for variation in the education, training, and certification of active health educators, so it was not desirable to use specific attributes such as the possession of a Masters of Public Health degree, or CHES certification, as criteria for inclusion in this study. Limiting participation to health educators who have particular certifications or degrees would ultimately have excluded many individuals who clearly belonged in the study, because of the work that they are engaged in. Instead, the rationale was to study those people who are currently engaged in health education activities, and then to determine what other attributes, such as education or certification, they may possess.

The second dimension of the population frame was the workplace setting for the health educator. Respondents for this study must work for a public health department. For most, this was a county health department, as that is the level of local government that

usually is responsible for the direct delivery of public health services to community members. In some cases, when a county is sparsely populated or lacks sufficient funding to support its own public health department, a regional health department is established, which serves more than one county. Also, there are seven independent cities in Virginia that are located within a designated Appalachian county, but are not affiliated with a county government. However, for each of these independent cities, the health department serving their citizens is a joint venture between the city and county governments, so they were included in combination with their county partners (see Appendix B). In contrast, public health educators who work for other kinds of organizations, such as schools, universities, hospitals, non-profit health-related organizations (such as the American Cancer Society), or private corporations, were excluded from this population frame. While it is true that the information behavior of health educators in these other settings is also worthy of study, limiting this criterion to this level of specificity provided a reasonable and consistent way to appropriately focus the scope of the research.

Intuitively, it was anticipated that a health educator's work setting would have an impact upon his or her information behavior, in that it might entail distinct kinds of activities, or provide or restrict physical and economic access to different kinds of resources. This research focused on public health department health educators because they constitute a large and accessible subgroup of their profession. In addition, the consistency of the county-based structure of the U.S. public health delivery system provided a natural foundation for underscoring both the common elements and the distinctive aspects of individual respondents' information behavior. Among all of the

specific types of health educators, those individuals who work through public health departments serve on the front line of their profession, helping a wider variety of population groups, and often addressing a broader range of issues, than their counterparts who work in more focused settings. Therefore, the scope and diversity of practice experienced by health department health educators made them a particularly interesting and appropriate choice for this initial foray into studying the profession's information behavior.

The third dimension of the population frame specifies the geographic region – Appalachia -- in which the public health educator must work, in order to qualify as a respondent. This study used the standardized definition of Appalachia used by the Appalachian Regional Commission (ARC), the ongoing federal-state developmental partnership created by Congressional law in 1965 to address socioeconomic problems in the region. (See Chapter One for a more detailed description of the ARC and its history). Using the widely-accepted, socioeconomically-based ARC definition (as of 2010), Appalachia is comprised of 420 specific counties distributed across 13 states, and is populated by approximately 24.8 million people. (See Appendix B for a listing of all Appalachian counties by state.) Combining the three dimensions together, qualifying respondents were currently employed as health educators, by a public health department (serving either a single county or a multi-county region) that is situated in a county (or region or city, if applicable) designated by ARC as falling within the Appalachian region.

This study was designed to conduct a census of the public health department health educators, working in designated Appalachian areas. A census attempts to measure

all members of a specified population, as opposed to measuring the responses of a representative sample of members of that population (Alreck & Settle, 2004). A census is an appropriate approach to the fundamental issue of who is to be studied, because of the simple, clearly-delineated criteria defining the population, and the fact that the estimated total population is ultimately a finite, identifiable, relatively stable, and manageable number of people to be contacted for the study. The term “estimated” was used to refer to the entirety of the defined study population, rather than a specific number, because of three factors which could have potentially caused a variation in the size of the actual population, versus the estimated size of the study population, at the point at which the study was deployed. These three factors are: 1) staffing differentials between counties of different population sizes or economic status, 2) natural workforce fluctuations, and 3) structural differences between regional and county health departments.

The exact size of the defined population is of course a finite number at a particular point in time, but that number could potentially vary somewhat from one day to the next, and it could not be definitively determined from a systematic examination of each public health department’s online personnel directories, because of the three factors listed above, and because staff positions and/or names were not uniformly available on public health department websites. For the purposes of fielding the study, the total number of health educators qualifying for participation was estimated to be about 450, but with a potential upper range of 491, based on an estimating strategy of one per county, one per district (where applicable), and one sent out to any named health educators who were identified on their LHD’s website. The population was estimated to

be no less than 420, the number that would be expected if each county had only one health educator.

Each of the three factors helps to explain the rationale for not just assuming that there was a simple one to one relationship between the number of Appalachian counties and the number of health educators qualifying for this study. The first factor, staffing differentials based on county size, refers to the fact that health departments serving counties with larger populations, particularly those containing urban areas, are more likely to have a larger staff of health educators, sometimes even at multiple locations, in order to carry out a similar mission, just on a larger scale. In contrast, smaller counties (measured by population) are likely to use one delivery point, and have one health educator, or even one shared with one or more counties, on staff. For example, Knox County, Tennessee, which includes the major city Knoxville, has four delivery locations for public health services, and has at least three health educators on staff. Monroe County (population approximately 45,000) has a single delivery location, and a single health educator.

The second factor is the effect of normal workforce fluctuations. At any one point in time, a health educator position may be unfilled, because of the natural attrition that occurs as people transfer from one position to another, so that a particular public health department might be in a hiring cycle. (Or, a position might exist, but be empty and frozen for some period of time, so that the county is effectively without that health educator. Another kind of workforce fluctuation might be the use of part time or temporary staffing for particular events or periods of time, such as when an LHD plans a

particular health promotion event or campaign, and takes on additional health educators for that purpose. The study's population frame would have included temporary or part time health educators, provided they were currently working in that capacity at the time of the study.

The third factor relates to the differences in organizational structure between a county health department, and those that are amalgamated into a regional health department. A regional health department can provide an overarching layer of management for the county-level health departments for two or more individual counties with smaller populations. In the case of a regional health department overseeing six Appalachian counties, a typical arrangement might be to have two or three of the counties in the region sharing a single health educator, so that the regional office employs three health educators. But there were also instances found in the study in which one health educator at a regional level is solely responsible for eight or more counties. Another scenario identified is that some multi-county regional offices do not employ even one health educator.

To conduct the census, ideally an accurate, comprehensive, and timely listing of all of the members of a population is constructed ahead, and used as the basis for contacting individuals and administering the survey. However, this census of health educators working for public health departments in Appalachia instead was administered from a list of all of the public health departments in each Appalachian county, identifying both the county LHDs, and if applicable, the regional/district level offices, and which counties were under the administration of each regional office. In order to attempt to

identify all of the individual qualified health educators who needed to be invited to participate in the study, information about these health educators was compiled from multiple sources. The local health departments (LHDs) vary considerably in terms of their web presence, and the amount of staffing information made available online. As the local points of service for their state department of health, all of the Appalachian LHDs have at least their address, phone numbers, and operating hours available through some form of a “local health department” link off their state department of health’s website. Some of the LHDs and regional health departments have their own individual websites, with varying levels of detail regarding contact information for their staff members. From this information, a respondent database was constructed, using the names of public health educators that are available online through either the state or local health department websites or other sources, as part of the individual database record for each county or district health department. To a limited extent, online sources of potential respondents’ names were augmented by names obtained by telephone inquiry, for the LHDs that do not have this information available online. The mailing addresses and phone numbers for all of the Appalachian LHDs are available online, and therefore were included as are part of the database record for each health educator eligible to participate in the study.

The survey distribution design also allowed for participation in the study by qualified health educators whose names were not identifiable ahead, in order to make the census as inclusive as possible. Many names were not identifiable ahead for several reasons: some LHDs have only a minimal website, with no staff listings, or directories that require logins to be accessed. Others have additional health educators on staff who

are not necessarily listed on their websites. Some LHDs may have policies or practices prohibiting them from giving out staff names over the telephone. Many LHDs did not mention whether or not they had a health educator position on staff, even anonymously. To cope with this situation, the mailed invitations to participate were addressed in the name of a specific health educator when applicable, but also include the phrase “or other health educator” on the addressee line. For mailings to counties or districts where no named health educator had been identified at the point the survey packets were to be deployed, these packets were simply addressed “Health Educator,” and sent to the LHD or . regional HD’s address. The text of the enclosed invitation to participate encourages the recipient to forward the invitation to other health educators at his or her workplace, while also providing a URL for an online version of the study instrument that can be used by other health educators not directly targeted by the paper version of the instrument. (See Appendix C for the text of the invitation to participate.)

### *Hypotheses*

This section presents the hypotheses that were tested in this study. They were constructed to build upon the five basic research questions presented in Chapter One, by extending the research question topics into more specific areas, and then offering predictions related to those specific areas, based on the expectations formed from the review of the literature, and the findings from the formative interviews with health educators. The full operationalization of the concepts reflected in the hypotheses, and the linkages between the hypotheses and particular measures on the survey instrument, is presented later in Chapter Three, in the section labeled “Operationalization of the



Concepts and Variables.” The results of the study, including whether they support or refute the hypotheses, are reported in Chapter Four.

*Overarching Theme*

H1. The work of these health educators emphasizes the dissemination of packaged information, rather than finding or directing clients to information.

This hypothesis addressed the proportioning of work between the delivery of prepackaged programs, or information seeking activities, and that predicted disseminating packaged information would emerge as the dominant activity of these LHD health educators. A fundamental assumption of the study design was that developing new programs rather than delivering prepackaged ones, would involve more, and more complex, information needs, which would require the health educators to spend time finding information for their own needs, or directing their clients to relevant information for their information needs. Therefore, this hypothesis implies a greater emphasis on the less information-intensive activity of delivering a premade program, rather than developing a new one.

The need to explore the focus of these health educators’ work in terms of this dichotomy of program types was inspired by the experiences of the health educators as described in the formative interviews, as well as knowledge acquired by the researcher from Public Health courses completed as part of her doctoral studies. It should be noted that there is some area of overlap between the concepts of prepackaged and original health education programs, which warrants further description. For example, health educators who are preparing to deliver a prepackaged program coming from the CDC, for example, are likely to make some individual alterations to the prescribed program, in

order to make it more appealing or more directly relevant to her local community audience. A prepackaged program with relevant content but with a visual style that would appeal to a strongly urban audience, for example, might be augmented with other material or staging or visual aids added by the health educator, to tone down the urban flavor in favor of something more appealing to a rural audience. In addition, the creation of an original health education program typically involves using existing health facts, statistics, and information that are acquired from other sources. The health educator then creates a program theme, or an event setting, to convey the factual content and behavioral messages in an appealing or entertaining way, in order to attract and hold the targeted audience.

While acknowledging that there is usually some original aspect added to a prepackaged program, but also prepared data and information within original programs, the distinction between the two program types lies in the primary creation of the program. It either originates from an external (usually authoritative) source, or it is primarily the creative product of the health educator.

*Theme: Perceived Information Needs:*

H2. Health educators who characterize their work as addressing a wide variety of health challenges will perceive a more frequent need to engage in information seeking than health educators whose work focuses on specific health challenges.

H3. Health educators who are developing new programs will perceive a more frequent need to engage in information seeking than health educators who are delivering packaged programs.

These hypotheses addressed the research question about how health educators perceive their own information needs. H2 reflected an assumption that a health educator who must constantly engage different health issues will have to engage in some form of information seeking as new issues are introduced, whereas those whose work focuses on a particular area will have more of an established knowledge base on that health topic. H3's prediction was also based on the same premise that addressing a new area will entail fresh information needs and information seeking activity.

*Theme: Perceived Information-Seeking Ability & Information Literacy*

H4: Health educators with more advanced credentials (e.g., MPH degree and/or CHES certification) will be more likely to rate themselves as having a higher level of information seeking ability than health educators without credentials.

H5: Health educators who have received formal training (either as part of their MPH degree or in professional development) in the use of electronic information sources will be more likely to perceive themselves as having a good to high level of information literacy.

H6: Health educators who have a more frequent need to engage in information seeking will express a higher level of ability to access information sources than health educators who report infrequent information needs.

These three hypotheses addressed the respondents' perceptions of their own ability to find information, and to judge its quality and applicability to their needs. H4

and H5 reflected an assumption that the higher level of academic work and level of expertise conferred by the CHES certification may predict that a person will have more confidence in their ability to find and evaluate information. This may reflect more experience with information technology during the course of their studies, or even specific training that might have been received as part of their degree program. H6 assumes that practice may help to make perfect, in that people who do more information seeking may learn from their experiences and improve over time.

*Theme: Information Seeking Strategies & Source Preferences/Satisfaction:*

H7: Health educators engaging in more frequent information seeking will be more likely to use a narrow range of trusted sources than to explore a wide variety of sources.

H8. Health educators will be more likely to use an interpersonal information source initially than a mediated one, to address their information needs.

H9a: Health educators' frequency of use of print or electronic library based resources will be lower than that of electronic information sources available through the web.

H9b. Health educators' frequency of use of library based resources will be lower than that of non-library interpersonal sources.

These three hypotheses (H9 actually has two parts) addressed the research question about health educators' basic information-seeking strategies and their preferences concerning information sources. H7 assumes that the respondents who frequently need to look for information will probably develop some familiar and

comfortable patterns of using a favorite selection of proven sources, and will use them well because of their high degree of familiarity with them. H8 reflects the long-established tendency of people in general to prefer turning to interpersonal information sources over mediated ones, when the interpersonal ones are readily available. H9a and H9b both were based on the assumption that health educators will underutilize libraries as sources of information and librarian assistance in finding those resources. This expectation was based on the findings of the formative interview with the LHD health educator, and concerns about access to library resources in Appalachia.

*Theme: Effects of Economic Status of Service Area:*

H10: Health educators in advantaged areas will report a higher level of use of electronic information sources than Health Educators in challenged areas.

H11: Health educators in advantaged areas will more frequently perceive a need to engage in information seeking than health educators in challenged areas.

H12: Health educators in advantaged areas will use library based resources more frequently than Health Educators in challenged areas.

These three hypotheses offered predictions about the effects of a county's socioeconomic status on the information behavior of health educators working in that county. The assumption underlying the direction of these predictions was that counties with higher socioeconomic status will have better access to electronic information sources and to library resources. H11 extended this assumption by presuming that

improved access to electronic sources and libraries will encourage the health educators working in advantaged counties to engage in more information seeking because of that improved access. Economic status of each county was determined by its classification according to the ARC index, and was included as a part of each record in the contact database.

### *Research Procedures and Data Collection*

This section describes the mechanics of how the study was fielded, including the method selected for collecting data, the physical delivery of the instrument, and the backup procedures for contracting respondents, which were employed to boost the response rate.

This study used a survey instrument to collect data about the participants' information behavior. Although the title of this project includes the word "behavior", which might normally inspire an expectation of an experiment or observational study, the concept of "information behavior" incorporates major components of attitudes, expectations, and perceptions. These phenomena are well suited to a survey method for data gathering (Sumser, 2000). As mentioned in Chapter Two, the goals of this study are to provide a descriptive analysis of the role that information plays in the work of health educators working in Appalachia, to establish a fundamental understanding of how they perceive their information needs and what steps they take to address them. To create this initial picture of the phenomenon in question, a survey emphasizing descriptive topics was chosen as the research tool, because it is an efficient, low-cost, and expedient way to gain general baseline information about the respondents' information behavior, while

capturing the range of potential reactions to the measures across the population by using a census rather than a sampling approach. This study provides an initial description of selected key aspects of the participants' information behavior, which lays useful groundwork for a subsequent, more in-depth study, incorporating qualitative methods such as long interviews and participant observation, and using a purposive sample drawn from these Appalachian public health educators.

A self-administered survey was also well suited to the specific circumstances of this project. Trochim (2001) sets out five key questions that a researcher should ask himself about the population to be studied, in order to determine if a self-administered survey is an appropriate method. The questions boil down to these five criteria: 1) the population can be enumerated; 2) they are literate enough to cope effectively with reading and understanding the questions; 3) language is not an issue; 4) the population is likely to cooperate with the survey; and 5) they are dispersed across a geographical area widely enough that using a personal interview or researcher-administered questionnaire is not feasible. This study's design met these five criteria. The estimating strategy employed to determine the number of surveys that were distributed accommodated a large potential population level. Health educators must be sufficiently literate and fluent in English to design and deliver educational programs to the public, so it was a safe assumption that would be able to effectively use the self-administered questionnaire. While the fourth criterion is difficult to apply as a factor in deciding whether or not to use a survey, health educators are members of a helping profession, whose work puts them in the public eye, and stresses open communication. All of these seemed to be traits of

cooperative people who would be inclined to assist an academic researcher, and who would probably be comfortable expressing insights about their work. The pilot test of the survey instrument achieved a 60% response rate, which was a hopeful indicator of an adequate response rate on the actual survey. The formative in-depth interviews were also a good bellwether that study participants would not be suspicious of, offended by, or otherwise especially reluctant to engage the survey. The fifth and final criterion clearly applies to Appalachia, the defined geographic region for the study. Although conducting personal interviews or administering a written survey in person normally yields a higher response rate, a self-administered questionnaire was the appropriate choice, considering that the Appalachian region stretches for over a thousand miles across thirteen different states. Conducting a census using face to face administration of the questionnaire, while dealing with this level of geographic dispersion, was not feasible neither temporally nor economically, for this doctoral research.

The survey was distributed to the participants primarily as a paper instrument, although an online electronic version of the instrument was made available both as an alternative method of initial response, and to some extent, for the later reprompting of individuals who did not respond to the initial invitation. The initial contact consisted of an envelope delivered via the U.S. mail, containing five items: the invitation to participate in the study, the informed consent statement, the survey instrument, the entry sheet for the incentive prize drawing, and a preaddressed, stamped return mail envelope. (Each of these items will be described in more detail in the paragraphs that follow, and their actual text is included in Appendices C and E.) U.S. mail was chosen as the primary



delivery method for the survey, as opposed to a telephone administration of the questionnaire, because of its relatively lower cost and simplicity, and increased convenience for the respondent. Health educators often have to leave their offices to deliver informational programs or to meet with community leaders as part of coalition building activities, or in some instances, even to travel between LHDs in their multi-county territories, so reaching them by telephone during their workday to administer a survey becomes a difficult and labor-intensive activity, and would have increased the cost and time needed to complete the study. Using either a mail or online survey allows the health educator to complete the survey at his or her convenience.

Another option that was considered for the delivery of the survey is an online instrument announced by an emailed invitation. This delivery option had the considerable advantages of a faster turnaround time for the completed surveys, no postage cost, and no need to enter the data by hand. However, one of the issues that this study measured was determining whether these Appalachian health educators have internet access (and what its quality is) for their work. Because of this uncertainty, an online instrument was not chosen as the primary means of delivering the survey, as it might introduce a selection bias in the results, by only delivering the invitation to potential respondents who do have Internet access. All potential respondents are served by the U.S. mail, so using a mail delivered survey as the primary method avoided this potential bias that could have skewed the results of the study. In addition, the mailed paper survey was also given primacy over the online survey option because surveys announced by email generally have lower response rates than “snail-mailed” surveys (Shih & Fan, 2008). However, the

initial paper invitation gave respondents the choice of using either the attached paper questionnaire or, if she has internet access, going to the URL provided in the invitation to use the online version of the instrument. Giving respondents as much flexibility as possible in the ways they can respond to the questionnaire probably had an additional positive impact on the response rate.

One of the drawbacks of using a self-administered mail survey is that it is more likely that some recipients will not respond to it, as opposed to a survey administered via telephone or by a face to face interview. Based on the results of a selection of methodological articles, a reasonable response rate to surveys initially distributed by mail can be expected to vary from 39% to 56%, (Baruch, 1999; Cook, Heath, & Thompson, 2000; Kerlinger, 1986) which leaves a substantial portion of unanswered surveys. In the anticipation that such a percentage of the initial mail surveys may at first not be returned (or answered online), this study originally planned to use a comprehensive backup strategy for recontacting potential respondents. This backup strategy is described in detail here; however, it was applied only to a limited extent to improve the return rate on this study, because it proved to be too time consuming and labor intensive to execute completely according to plan, by a single researcher, for the hundreds of potential respondents that did not respond to the initial paper survey. (See Chapter Four for a report on the ultimate response rate for the study.) This backup strategy is likely to be applied more completely, to continued efforts to connect the survey with Appalachian health educators who did not participate in the initial study, as a

post-dissertation extension and completion of this census (see the Further Research section of Chapter 5).

The backup strategy for a second wave of prompting was to contact non-responders by telephone, in order to ascertain whether they actually received the initial invitation, and to determine what their preferred mode for addressing the survey would be. The researcher was to make this telephone call, using the LHD telephone number readily available on the Internet and included in the contact database, between one week to ten days after the original invitation's mailing date. During this telephone reminder, the health educator would be encouraged to either return the original paper questionnaire, or if they had Internet access, to use the online version. If neither of these options were feasible, the potential respondent would then be given an opportunity to have the survey administered at a convenient time over the telephone. If this option were also not feasible, the person would be told that a second copy of the paper questionnaire would be mailed to him, and he would be encouraged to complete and return it promptly.

Using a telephone call as the secondary means of contact provides many advantages. If the researcher is actually able to speak to the health educator directly, it can establish a personal contact between the two conversants, which can help to emphasize that the survey is serving an educational (rather than commercial) purpose, and that completing it constitutes a more personally helpful act by the respondent. The successful phone contact will also allow the researcher to determine each respondent's awareness of the initial paper invitation, and to then enumerate the various options for completing the instrument, to help the respondent select the most appropriate one for him

or her to use. These options include the direct administration of the questionnaire over the telephone, a choice which guarantees an accurately completed survey from that individual. This phone conversation can also allow the researcher to establish whether the particular respondent has access to, or uses, email, so that if a third contact is required, the email option can be either confirmed or eliminated as a potential means of contact.

When non-responders are contacted secondarily by telephone, another potential outcome is that the researcher will not reach them personally, but will instead reach a voice mail system for them, or have to leave a message with another person. In the event that the secondary telephone contact results in a message rather than an actual conversation with the potential respondent, (which was often the case for this study, to the extent to which this technique was applied) the researcher will still be able to use that message to call attention to the first mailed invitation, to point out the online survey option, and to offer to call back at the respondent's convenience to administer the questionnaire over the phone, or to answer any questions or concerns the respondent may have about the survey, and to invite the potential respondent to state a preference about how they would prefer to access the survey. The telephone contact that results in a message left for a potential respondent still helps to distinguish this academic survey from "junk mail" or commercial surveys, and is therefore still an effective method for a secondary contact. For all secondary calls that result in messages left rather than an actual conversation with the potential respondent, a follow-up phone call will be made within

two days after the initial call, unless the health educator calls the researcher back before that time.

Because the secondary contact by telephone could occur under four different conditions, alternative telephone scripts were created, to match the circumstances of the individual health educator who is being called. Using scripts for these telephone calls standardizes the information being given to each respondent, and insures that it is complete, accurate, and gives each potential respondent an equal chance to participate in the study, to avoid introducing any bias. Each of these four conditions is stated separately below, along with the key points made in each script. (The complete text of the scripts is included in Appendix D.) For any of the four conditions, the initial part of the conversation or message was written to identify the researcher and briefly describe the study, and remind the potential respondent about the initial paper survey they should have already received. The conversation or message also includes appropriate contact information for the researcher.

Condition 1: the non-responder is reached for an actual telephone conversation, and has email access: In this case, the researcher confirms receipt of the initial paper instrument, then encourages its completion and return, points out the online instrument option, and if necessary offers to give the survey over the phone at that time or to call back at a time of the respondent's choosing, or to mail out a second copy of the paper instrument.

Condition 2: the non-responder is reached for an actual telephone conversation, and does not have email access: The researcher confirms receipt of the initial paper

instrument, encourages its completion and return, but then offers to give the survey over the phone at that time or to call back at a time of the respondent's choosing. If the respondent rejects either option for telephone administration, the researcher then offers to mail out a second copy of the paper instrument.

Condition 3: the non-responder is not reached directly, so a message is left on voice mail or with another person, and the non-responder is known to have email: (The availability of email for this non-respondent will have been established either from his LHD's online directory information, or has been confirmed by the message taker). In this case, the researcher encourages timely completion and return of the initial paper instrument, but then point out the online instrument option. In addition, the researcher offers to call back at a time of the respondent's choosing in order to administer the survey over the telephone. Finally, the caller offers to mail out a second copy of the paper instrument, if that mode is preferred. If the non-respondent does not call the researcher back within two days of this second prompt, the researcher will call the health educator back again at that time.

Condition 4: the non-responder is not reached directly, so a message is left on voice mail or with another person, and the non-responder is not known to have email: (The condition includes when the LHD's online directory does not list an email address for this person, or when the person taking the message either does not know whether the health educator has an email address, or the message taker knows that the person definitely does not have email.) The researcher encourages timely completion and return of the initial paper instrument, but then the researcher offers to call back at a time of the

respondent's choosing in order to administer the survey over the telephone. Then the caller will offer to mail out a second copy of the paper instrument, if desired. If the non-respondent does not call the researcher back within two days of this second prompt, the researcher should call the health educator back again at that time.

For the potential respondents who do not respond to either the first or second wave, a third prompt was included in the backup plan to reach respondents. The third wave was to be sent out via email, urging the recipient to use the online survey instrument. For these non-responders who do not have a known email address, another copy of the paper questionnaire was to be mailed out. If some members of the defined population have still not replied after the third wave of prompts, it would be assumed that they do not want to participate in the study.

When the survey for this study was actually deployed, the third wave method of email contact was actually implemented with some success, but as a second method of contact, for health educators for whom the email address was available. Second copies of the paper survey instrument were not actually sent, because of the large expense of sending out the initial wave of paper surveys. (Note that extra-ounce postage was required for both the outgoing and return mail envelope for the paper survey, which increased the cost of this method even more.) The additional technique to increase the response rate for the survey, which proved to be very effective, was to send an announcement to the directors of each local health department (for whom a name and contact email were available), explaining the nature of the research and asking them to encourage their health educators to complete the survey. (See Appendix G for the text of

the emailed directors' announcement.) This effective technique was based on a suggestion by a member of the researcher's doctoral committee, made during the research proposal defense.

*Content of the Invitation and Instrument*

As the initial means of contact for the study, potential respondents received a mailed envelope containing the invitation to participate in the research, the informed consent statement, the paper version of the instrument, and the incentive prize drawing entry sheet. The electronic versions of these items were also an option for respondents who preferred to use the electronic format rather than the paper one at the point of initial contact, or for additional health educators at a particular LHD. The electronic versions of these items are essentially the same as the paper versions, except for some small, specific variations necessitated by each format. Key aspects of each of these components will be described and explained in this section. The actual text of each of these elements is appended to this proposal; the text of the invitation and Informed Consent Form are in Appendix C, and the survey instrument is in Appendix E.

The invitation to participate in the study briefly identified the title, origin, and purpose of the project, as well as the group of people who may participate. It encouraged qualified respondents to share their insights and experiences, and stated the benefit that the population will receive from participating in the study. The invitation promised confidentiality of responses, and defined Informed Consent for each format. Finally, the invitation announced the incentive drawing, and researcher contact information.

The Informed Consent Statement was in the form mandated by the University of Tennessee, covering the anticipated risks, benefits, compensation, confidentiality,



available medical treatment, and researcher contact information, associated with participating in a survey study using adult respondents. The Statement also defined what constitutes a respondent's acknowledgement of informed consent, for the two formats of the questionnaire. For the paper version, informed consent was given by signing and returning the Informed Consent form; for the online version, it is demonstrated when the respondent chooses to click on the link to access the survey. In addition, the complete Informed Consent statement was made available on a website created by the researcher; the URL for this e-version of the statement was provided in the online version of the survey.

The instrument itself contained three main parts: an initial section for demographic and other descriptive information about the respondent, the major section containing the structured questions, and a final section with two open-ended questions (The paper version of the instrument is presented in Appendix E). The first two questions functioned as screener items, establishing that the respondent works as a health educator for a public health department. Qualified respondents then answered questions about their educational background, age, and sex. The demographic section also contained fill-in questions where the respondents indicate the state and county in which they work. This information was essential for tracking which counties or districts had respondents who had participated in the study, and for categorizing the responses on other measures according to the socioeconomic status or health status of the county or district. Although there was some concern going into the project, that some health educators, particularly those who work in small counties, might be reluctant to identify their location out of a

concern that it might compromise the confidentiality of their answers, these potential concerns turned out to be non-factors. All respondents chose to identify the state and county/district in which they work, possibly because the “confidentiality” section of the Informed Consent Statement emphasized that the location information was being collected to track the completeness of the census response, and that the location information, like the other data gathered through all of the other measures, would only be used in aggregate for statistical and descriptive analysis.

The main section of the instrument begins with questions that describe the frequency of occurrence of an array of activities that health educators engage in, and then explore how frequently those activities create an information need for the health educator. (The concept of “information need” is defined as part of the relevant question.) Other questions in this section explore the proportion of time that health educators spend on delivering original or prepackaged educational programs to their audiences, and the scope of the health issues they typically address in their particular community. The next subsection of the questionnaire assesses the respondents’ perception of their abilities to find and evaluate information, and the formal training they have had in using electronic information sources. The next section of questions addresses the actions taken and sources consulted by respondents when they experience a work-related information need. This includes a question forcing respondents to identify the one source they typically turn to first. Their frequency of use of various kinds of library-based resources is also measured. To explore a range of attitudes they might hold, the final structured question

uses a four-point Likert scale to measure the respondents' level of agreement with a variety of attitudinal statements about the role of information in their work.

Most of these questions sought to establish either the prominence of certain activities or behaviors by using a frequency scale, or they measured the respondents' satisfaction levels with their own abilities or experiences by using a satisfaction scale. For the questions using a frequency scale, the response category labels included both the verbal category (such as "frequently" or "occasionally") along with a corresponding quantification, defined in terms of the number of estimated occurrences over the course of a typical year (such as 6 to 9 times, or once or twice a year). This simple quantification of the response categories served to standardize the respondents' interpretations of the verbal categories, and make the descriptive statistics yielded by these measures more consistent and meaningful. The response categories for the satisfaction measures are limited to four choices: very satisfied, satisfied, dissatisfied, and very dissatisfied. No neutral category is included, in order to force respondents to indicate either a positive or negative reaction. Where appropriate, an additional response category was added to some measures, which functions like a "not applicable" category. For example, in a measure of frequency of use of various library resources, the additional category allowed respondents to indicate that they do not have access to a particular resource, so that this situation can be distinguished from a response indicating that the person has access to the resource, but chooses to never use it.

The final section of the instrument consists of two open ended questions. Open-ended responses are important to include in a structured survey because they allow the

respondent to provide insights that were not anticipated (and therefore, not measured) in the construction of the structured questions (Watt & van den Berg, 1995). Open-ended questions also allow the voice of the respondent to be heard, rather than just constraining their expressions to the language of the researcher, and therefore add richness to the data. The first open-ended question asked respondents what information-related resources, technology or training would make their work easier to do. The second open-ended question functioned as an open forum for respondents to say anything they would like about the information-oriented aspects of their work.

The final page of the initial mailed packet was the entry sheet for a prize drawing, an inducement for people to respond to the survey . Self-administered surveys often have low response rates, and offering an appropriate inducement is one way to increase the percentage of people who fill out the survey (Alreck & Settle, 2004). The incentive for people to participate in the survey was that they may opt-in to a random drawing for an iPod. Participants who chose to enter the drawing put their name and preferred contact method (email or telephone) on the entry sheet. The entry sheet was stapled to the back of the paper questionnaire, so that when a completed survey was returned, it was immediately torn off and separated from the data filled in on the instrument, in order to preserve the confidentiality of each respondent. Because participation in the drawing requires a respondent to reveal his name and contact information, it was optional, so that individuals who felt especially concerned about their confidentiality could make the choice to forego entering. In addition, several participants indicated that their employing agencies had policies against accepting “gifts” that extended to not accepting incentives

for participating in research. The completed entry sheets were accumulated throughout the duration of the study, while respondents who used the online survey, could also participate in the drawing. To conduct the drawing, each entry sheet and online entry were given a unique number, assigned in the order in which the completed surveys were received. When the field portion of the study was completed, the pseudo-random number generator function in SPSS was used to select the one winner, based on the corresponding identifier number. The prize was sent to the winner by U.S. Priority Mail.

*Paper versus Electronic Format for the Instrument*

As mentioned above, the paper instrument was the primary means of distributing the survey. The invitation, consent form, instrument, and drawing entry sheet were sent via U.S. mail to each of the Appalachian public health offices at both a county and district level (when applicable), and a packet was also sent to all health educators that had been identified prior to the start of the study. Included in this contact envelope was also a pre-stamped, pre-addressed return envelope, which the respondents could use to submit the completed survey and other paperwork, at no cost to them. The paper surveys were addressed to be returned by mail to the researcher's residence address, and also included her business address as the return address on the return envelope.

Although the paper questionnaire is the primary instrument, individuals could also elect to respond to the initial survey invitation by using the online electronic version of the instrument, available at a specified URL. Making both print and electronic versions of the instrument available to respondents allowed additional health educators at a particular location to participate in the survey, as well as allowing respondents to select the version they preferred.

The electronic version of the instrument was created and accessed through the online survey software package mrInterview, provided through the University of Tennessee Knoxville. In substance, the electronic version of the questionnaire is equivalent to the paper version for almost all of the questions. The few differences arise from the mechanics of the two formats. For example, when a question calls for a skip, on the electronic version, the respondent does not see the portions of the question that are being skipped, because the program simply brings up the part of the question to which the program has led the person. With a paper instrument, the respondent sees the portions of the questions that she is supposed to skip over. The advantage of the electronic version is that skip errors are much less likely, because the person cannot access the portions of the question that he is not supposed to answer. With the paper version, it is more likely that the respondent may not always follow the skip instructions correctly, and sometimes answer portions of the question that she is not supposed to go to.

Another difference between the two formats of this instrument is how it presents the demographic question about respondents' academic training or certifications. On the paper version, the respondent sees a checklist of various items, and each one has a blank next to it for the respondent to fill in the year that the credential was earned. On the electronic version, the survey will only ask for the "Year Earned" on the items that the respondent has indicated apply to him.

These differences are largely cosmetic, and were not expected to have any meaningful effect on the results or the experience of the respondent. A more substantive difference is that the invitation for the paper version is presented as a cover letter for the

other elements in the envelope, including the survey. The paper format of the Informed Consent Statement is separate from, but bundled together with, the other components of the paper version. For the electronic instrument, there is a variation, depending upon which stage of the process the person is in when he decides to use the online version. If the participant decides to use the electronic version after reading the paper cover letter, he will also be using the paper version of the informed consent statement, and will then enter the URL that is given in the paper cover letter to access the e-version of the survey. However, if the person did not respond to the initial mailed invitation, but instead receives an email invitation inviting him to access the online instrument, he will see that the electronic invitation and the Informed Consent Statement are integrated into one email, which also delivers the live link that he can use to go directly to the online survey instrument. In this latter case, clicking on the link constitutes his informed consent to participate in the survey. Either way, the respondent has access to the explanatory invitation, the informed consent information, and a usable form of the survey.

Analysis of the data was conducted using the electronic statistical software SPSS version 19, provided to students by the University of Tennessee Knoxville. Data from the paper instruments must normally be entered into SPSS by hand, while the electronic survey responses can be downloaded directly into SPSS from mrInterview. To streamline this process, the responses from all paper questionnaires submitted by respondents were hand entered by the researcher into mrInterview, as if they had been originally submitted electronically. This allowed the data inputs from the two survey formats to become part of a single SPSS database, and facilitate a seamless analysis of the raw data. The text

from the open ended responses from both the paper and the electronic questionnaires was coded and analyzed by hand, using open coding on a thematic level. A more specific discussion of the kinds of analysis and statistical tests planned for the data is included in a separate section below.

### *Operationalization of the Concepts and Variables*

This section enumerates the concepts behind the research questions, and the variables that express them, linking them to the various indicator items from the appropriate survey measures. There are five concept areas or themes addressed by this study, and expressly stated in the five research questions presented in Chapter One: 1) information-seeking and use, 2) perceived information needs, 3) perceived information-seeking ability and information literacy, 4) source satisfaction levels, and 5) service area economic status. Some of these concept areas are addressed directly by one or more specific questions on the survey instrument, while others are explored by portions of multiple questions.

### *Information Seeking and Use*

Research Question 1 is primarily a restatement of an overarching theme of this proposed research. Information behavior is complex behavior, and the array of actions, judgments, and attitudes associated with finding and applying information is addressed in some dimension by each of the measures on the proposed instrument. Question 13 on the instrument addresses the multiple dimensions of information seeking and use by posing an array of statements that could conceivably be made by health educators like the study's respondents, and providing a four-point Likert scale for indicating how much respondents agree or disagree with the idea expressed by each statement. All of the



statements used for this measure express potential attitudes or actions associated with information behavior.

#### H1: Proportion of Time Spent on Original or Packaged Programs

This hypothesis broadly categorizes a potential motivation for the information seeking and use done by study respondents, by determining their perceptions about whether a greater proportion of their work involves distributing prepackaged information through prepared programs provided by a health agency like the CDC, versus having to engage in information seeking for their own use or in behalf of their communities. This hypothesis predicts that the preponderance of respondents' work will involve disseminating prepackaged information, rather than finding or providing information for programs they develop. Question 3 on the survey instrument directly addresses this "overarching" hypothesis, by asking respondents to pick the one statement that most accurately describes the proportion of time they spend on prepackaged programs or original programs. The range of responses on this measure provide five levels of response, including a neutral position stating that respondents' time is about equally divided between the two. Respondents who feel their time is spent on one option more than the other can indicate whether the preponderance involves "much more time" or "somewhat more time" to give more texture to their answers. The fact that the hypothesis predicts an emphasis on prepackaged programs is based on the pilot in-depth interviews, but even if it proves to be accurate, this finding should not be interpreted as indicative of a lack of a need for information seeking behavior by these health educators.

*Perceived Information Needs***H2: Information-seeking Frequency For Generalists vs. Specialists:**

Survey Question 4 asks health educators to indicate whether their work efforts tend to be focused on a small number of specific health challenges that are of particular concern in their community of service, or alternatively that their efforts address a variety of health challenges in their communities. Health educators who are supposed to focus on one or two particular health issues will be called “Specialists” here, while those dealing with a variety of issues will be labeled as “Generalists”. This hypothesis anticipates that self-described Generalists will perceive that they need to engage in information seeking more frequently than self-described Specialists will. To address this hypothesis, respondents were categorized according to their response to Question 4, and the two groups formed by this categorization will then be compared in terms of their responses to survey Question 2, which applies a frequency scale about the occurrence of information needs, to an array of health educator activities. Among the activities measured on Question 2, there are items which distinguish between prepackaged and original programs, which will make the determination of the level of support for this hypothesis even more clear.

**H3: Frequency of Information Needs by Program Source:**

This hypothesis states that developing original programs will be associated with a higher frequency level for health educators’ perceiving a need to engage in information seeking activities, versus the frequency level for respondents delivering packaged

programs. This hypothesis can be addressed by using survey Question 2, and examining the results for the two items that are about the two types of program sources.

*Perceived Information-seeking Ability & Information Literacy*

H4: Effect of Degree/Credentials on Self-assessment of Information-Seeking Ability:

This hypothesis predicts that health educators who have advanced credentials or training, specifically the MPH degree and/or the CHES certification, will be more likely to rate their information-seeking ability more highly than health educators with more modest credentials. To evaluate this hypothesis, data from the demographic section of the survey instrument, specifically Question D3, were used in a cross-tabulation, in which respondents who indicated that they have an MPH degree, were coded into one variable, and respondents who have the CHES certification were coded into another. Respondents who have both advanced credentials were included in both new variables.

Question 5 was used as the dependent variable, for this cross-tabulation. Question 5 asks respondents to rate their own ability to find information in response to a work-related information need. Question 5 provides a five point response scale ranging from excellent to poor. Strong support for H4 would be indicated if either or both credential groups tend to rate themselves as Excellent or Very Good at information seeking for their work, according to their responses on Question 5.

H5: Effect of Formal Training in Electronic Information Use on Self-assessment of Information Literacy:

This hypothesis anticipates that health educators who have received formal training in how to use electronic information resources will be more likely to perceive

themselves as having a good or high level of information literacy. Information literacy is used here in a general sense to mean respondents' ability to evaluate the quality of information, by judging its reliability, source authority, completeness, and appropriateness for a desired purpose. Survey Question 6 asks respondents to rate their own ability to evaluate information quality, and includes this same explanation of the concept, with using the term "information literacy". The response options for Question 6 are the same as the ones used for Question 5, the self-assessment measure for information-seeking ability. Survey Question 7a will be used to group respondents according to whether or not they have had formal training in how to use electronic information sources. Question 7a asks for a yes or no answer re formal training, and also defines what is meant by electronic information sources, providing examples such as health information online databases, electronic journal articles, and websites for health-oriented organizations. Respondents who answer "yes" to Question 7a are then given the opportunity to answer Question 7b, which identifies the circumstances in which the training was received, such as while earning an academic degree, for professional development at work, a combination of the two, or in some other circumstance, which can be listed on a fill-in blank. This analysis can be extended if desirable to include looking for different effects on health educators' self-perceptions of information literacy, depending on what the circumstances for the training were.

#### H6: Effect of Frequency of Information Seeking on Self-reported Information-seeking Ability:

This hypothesis states that health educators who more frequently need to engage in information seeking for their work will be more likely to rate their own ability to find information highly, as compared to health educators reporting less frequent information-seeking needs. Survey Question 2 will once again be used to identify respondents who report that they frequently have a need to search for information as a part of their work, versus those who only experience infrequent information needs. Survey Question 5 will be used to identify respondents who rate themselves in the top two categories of information-seeking ability, and the areas where these two measures overlap will be used to evaluate the hypothesis.

#### *Satisfaction with Information Resources*

This theme, which is expressed in Research Question 4, addresses how satisfied Appalachian health educators are with the information resources that are available to them. There is no hypothesis directed specifically at this theme, because it was included to provide a straightforward descriptive measure, rather than linking it to other effects or attitudes. It is assumed that there is most likely a direct relationship between satisfaction level and frequency of use of a particular resource, so that predictions of hypothetical relationships were reserved for use with the interactions between other variables. The respondents' satisfaction with using various kinds of information resources for their work is directly measured by Question 10. The four-point scale allows respondents to express

two degrees of satisfaction or dissatisfaction, or to mention that they have not used that particular source.

*Information-Seeking Strategies and Source Preferences*

H7: Effect of Frequency of Need for Information Seeking on Likelihood of Using a

Narrow or Wide Range of Sources:

This hypothesis anticipates that health educators who need to engage information seeking on a relatively more frequent basis for their work will be more likely to use a more narrow, defined range of trusted sources, rather than engaging in a wider, more exploratory search of a variety of sources. As with several earlier measures, the categorization of the frequency of needing to seek information stems from survey Question 2. To determine the preferred scope of a respondent's search, survey Question 13 includes two specific items that are relevant for evaluating this hypothesis: the first is the statement "When I research a health topic online, I usually try to restrict my search to specific websites I am very familiar with." Respondents' level of agreement or disagreement with this statement provide insight into the preferred scope for their online search. Another relevant statement under Question 13 is "When I first hear about a new health issue, I like to do a general search on the Internet (e.g., "Google it") to learn more about the topic. Again, the degree to which respondents agree or disagree with the statement will shed light on their comfort zone for tight or far-flung online searching. The rationale behind H7's prediction is that respondents who frequently have to search for information for their work may have more experience with online searching, and have developed some focused expertise using particular sources, which they can they use more quickly and effectively to save their overall time. In contrast, this hypothesis presupposes

that less frequent information-seekers might have to fish around more for information on a particular topic, and may not have as much experience in doing an effective “quick and dirty” search.

#### H8: Preference for Interpersonal Versus Mediated Information Sources:

This hypothesis predicts that health educators will be more likely to make an initial choice of an interpersonal information source to meet their information needs, rather than some kind of mediated one. This hypothesis can be evaluated based on the results of a single measure; survey Question 11 provides respondents with the same list of potential information sources, and asks them to indicate the one source that they would typically go to as a first choice to meet their work related information need. Two of the sources in the list are interpersonal: “asking a doctor, nurse, or other healthcare professional” and “asking a medical or health science librarian for assistance in finding the information”. Three of the listed sources are electronically mediated: “searching websites of health-related organizations like the CDC or American Cancer Society,” “searching for information available on the Internet,” and “using a library’s electronic databases of health information, such as journal articles.” There is also an “Other information source” option with a fill in blank, for which answers can be individually sorted into an interpersonal or mediated grouping. Question 11 does include two other potential sources which are print based: “consulting medical reference books that you own,” and “using printed resources available from a medical, health, or public library.” Print is a form of media, so these two responses could be included with the electronically mediated sources, or, if the distinction between electronically mediated sources seems to

be especially prominent, the print resources could be omitted from the evaluation of this hypothesis.

This hypothesis can also be tested within the narrower context of library-based resources alone, using survey Question 12. This question also uses a frequency scale to inquire about how often health educators use the electronic resources of various kinds of libraries, visit the libraries in person, or ask a health librarian for assistance in finding information (either in person or using the phone or chat). The various information sources can be grouped according to being interpersonal or mediated, and the frequencies compared.

H9: Relative Frequency of Use of Library-based Resources:

This topic is explored in a pair of related hypotheses, which collectively predict that library-based resources will be used less frequently than either information sources on the Web, or interpersonal sources of information.

H9a: Frequency of Use of Library-based Resources Relative to Web Resources:

This hypothesis anticipates that health educators' frequency of using either print or electronic library-based information resources will be lower than their use of electronic information sources available directly through the World Wide Web. The most direct way to test this hypothesis is to use survey Question 9, with its frequency scale and range of information sources, then group the library-based resources together, and compare their score levels with the two items that are web-based electronic information sources.

H9b: Frequency of Use of Library-based Resources Relative to Non-library interpersonal sources.



This portion of the hypothesis states that health educators will use library based resources less frequently than non-library based interpersonal sources. Again, survey Question 9 provides the elements to test this hypothesis directly, with its frequency scale, and range of potential information sources. Items in Question 9's resource list that can be grouped together to form the library-based resources include printed library sources, and the library's electronic databases of health information, and asking a librarian for assistance. Non-library based interpersonal sources would include the item for asking a healthcare professional, plus any item included in the "Other information source" fill-in blank that represents an interpersonal information source that is not affiliated with a library.

#### *Economic Status of Service Area*

This concept takes the analysis beyond a descriptive level, and predicts that there will be a statistically significant association between a county's economic status and the information behavior of its health educators, as measured by three specific information-related activities: use of electronic information (H10), frequency of perception of an information need (H11), and use of library based information resources (H12). The economic status of each Appalachian county is determined by the ARC's 2010 County Economic Status Classification System, available at [www.arc.gov/research/MapsofAppalachia.asp](http://www.arc.gov/research/MapsofAppalachia.asp). This system creates an index based on three established economic indicators: the three-year average unemployment rate, per capita market income, and the poverty rate. This index is computed for all counties in the United States, which creates a benchmark national index level to which the individual Appalachian county index scores can be compared. Because the three component

indicators are all based on undesirable statistics, a higher index score is indicative of a county experiencing a higher level of economic problems. Based on their individual index scores, all of the counties in the U.S. are ranked, and then divided into quartiles. An Appalachian county's relative position in this ranking is used as a basis for assigning it to one of five economic categories: Distressed, At-risk, Transitional, Competitive, and Attainment. The Distressed county category contains the worst ranking counties in the nation; they are the 10% worst off nationally. The next most financially bereft category is At-Risk, which envelops the 10-25% most economically struggling counties. Transitional counties are defined as those that fall in the middle 50% of all counties nationally. At the other end of the economic spectrum are the Competitive counties, covering the best-off 25-10%. The most economically successful counties have achieved the Attainment category, ranking among the best 10% nationally, as measured by this index.

According to the 2010 ARC Economic Status classification, out of a total of 420 Appalachian counties, 82 are categorized as Distressed, 79 are At-risk, 229 are Transitional, 24 are Competitive, and only six are classified as Attainment counties. (See Appendix B for a listing of all Appalachian counties by ARC fiscal category.) To compensate for the small number of counties listed in the two most economically desirable categories, this study combined Competitive and Attainment categories into one that will be called Advantaged. "Advantaged" is not an official ARC designation; it is a term coined for this study alone. For this conceptual area, Service Area Economic Status

will serve as the independent variable. Each of the three hypotheses addressing this concept area will provide at least one dependent variable for the analysis.

H10: Use of Electronic Information Sources:

This hypothesis predicts a higher level of use of electronic information sources by health educators in economically advantaged counties than in economically challenged counties. More than one measure can be used to comprise this dependent variable of frequency of use of electronic sources. Question 9 uses a frequency scale, and contains several examples of electronic information sources, such as websites of health-related organizations, the Internet, and electronic library databases. An alternative or additional choice for a dependent variable for this hypothesis is Question 11, which indicates the health educators' "First Choice" of an information resource, and uses the same resource list as Question 9. Therefore, respondents could indicate that they first consult one of the three electronic source options, which might indicate that a higher frequency level of using that source, because it is their first choice.

H11: Frequency of Engaging in Information Seeking:

This hypothesis anticipates that health educators working in economically advantaged counties will perceive that they have an information need on a more frequent basis than those working in disadvantaged counties. For a dependent variable for this hypothesis, Question 2 presents a type of frequency scale, in which respondents can indicate how often each of a list of health educator activities tends to cause them to realize that they have an information need. An analysis of this measure examines how many of these activities produce scores falling in the top or top two frequency categories.

## H12: Frequency of Use of Library-Based Resources:

This hypothesis predicts that health educators working in economically advantaged areas will use library-based resources on a more frequent basis than their counterparts working in challenged counties will. Question 12 addresses this hypothesis by using a frequency scale to measure use of an array of resources provided by various types of libraries. This question also is useful to differentiate between the kinds of library resources used more or less frequently by respondents working in each of the contrasting socioeconomic environments.

### *Methods for Data Analysis and Statistical Tests*

#### *Descriptive Statistics*

To address Research Questions 1 through 4, and their corresponding hypotheses discussed above, descriptive statistics presenting frequency values in cross-tabulated tables will be used to present the direct findings from each survey question. The rows of each frequency table will display the range of response categories for each item in a particular question. For example, for Question 1 about how frequently the health educator engaged in each of a number of typical activities, the frequency table would list each activity item as a row heading, then each of the frequency categories (dependent variables). Similar frequency tables display the results for each of the survey questions, depending upon the characteristics of each measure.

Placing an emphasis on frequency data presented in cross-tabulated formats is appropriate, given that the independent and dependent variables for this study are nominal. In addition, the study is designed to present a picture of the information-related activities and attitudes of the population in question, as an initial understanding of who

they are, and what kinds of general information-related behavior they engage in. The first four Research Questions, and their corresponding Hypotheses, all call for responses indicating how frequently a behavior occurs, or what level of satisfaction exists, as expressed in distinct categories. Descriptive frequency data is therefore an appropriate level of analysis to answer the general kinds of research questions that guide this study, and many of its measures.

#### *Contingency Table and Chi-Square*

To address Research Question 5, and its associated Hypotheses 10 through 12, a test of statistical significance is called for, in order to determine if there is a meaningful difference in health educators' frequency of use of electronic information resources, use of library resources, or their perceived frequency of needing to engage in information seeking, based on the economic status of the county or region in which they work. For these measures, the independent variables are the four categories of Service Area Economic Status, and the dependent variables are the various frequency categories for relevant measures of the three activities addressed by these Hypotheses. In order to determine if differences in the frequency data for these measures is actually affected by the economic status, a series of contingency tables coupled with Chi-Square statistical tests for significant differences in observed versus expected frequencies, are the appropriate test, to determine if the differences in the expected versus observed frequencies are statistically significant (Watt & van den Berg, 1995).

*Analysis Using An External Database*

An additional analysis was conducted using the County Health Rankings database that was recently made available by the Robert Wood Johnson Foundation and the University of Wisconsin's Population Health Institute ([www.countyhealthrankings.org](http://www.countyhealthrankings.org)). The County Health Rankings 2010 database provides information about each county in the nation, ranking each county against all other counties in the same state. The rankings are based on a composite index of indicators related to health outcomes, which measure morbidity and mortality. This database represents extensive secondary research, compiling existing data from a variety of respected standard data sources, such as the Behavioral Risk Factor Surveillance System, the National Center for Health Statistics, and the Environmental Protection Agency. The specific components of the Health Outcomes index, used as this study's variable called Health Status, are: Mortality, defined here as premature death (before age 75), and Morbidity: the state of being unhealthy, combined with the rate of low infant birth weights.

The index Health Outcomes category for each Appalachian county was extracted from this online database and used to define a categorical status for each county based on "health status", which is then used as another independent variable. The same kind of Chi-square analysis that was described above for the counties' ARC economic status designation, was applied to use this health status designation as an independent variable, to examine the impact of county health status on the health educators' information behavior.

*Pilot Test of the Survey*

In order to evaluate the functionality of the survey design, the survey instrument was pilot tested with respondents who could reasonably approximate the range of answers that might be expected from the actual respondents for the full survey, but who were not eligible to participate in the actual study. The pilot test of the survey instrument was conducted with health educators who work in settings other than for a public health department. A total of six health educators participated in the pilot test of the survey, and all six completed the entire questionnaire. The pilot surveys were completed over the course of late winter and early spring of 2010. All surveys were taken using the online survey instrument. Potential pilot participants were included on a list of ten health educators provided by a contact at the medical center of the University of Tennessee Knoxville, so the response rate for the pilot survey was 60%. Each health educator on the original list was contacted by email and asked to participate in the pilot study. (The text of the invitation is included in Appendix F). As an incentive, a drawing was held for a \$25 gift certificate for a retail store, for any respondent who completed the survey and elected to provide his or her contact information in order to participate in the drawing. The pilot test established that the survey could indeed be completed within 15 to 20 minutes, depending upon whether the respondent elected to complete both open ends. It also established that the questions made sense to the pilot participants based on their experience as health educators. The pilot survey did not reveal any substantial changes that needed to be made in the survey instrument, prior to the actual deployment of the study.

## Chapter 4

### Results and Discussion

This chapter describes the actual deployment of the survey instrument, the characteristics of the respondents who completed it, and the results for the various quantitative measures used in the survey. The results are reported both on the level of the aggregated totals for each item within each measure, and also using selected comparisons between subgroups of the overall responses, for particular facets of key measures. The level of support provided by the results for the study's original hypotheses is also described. In a separate section below, the results of the interpretation of the content of the open-ended responses are presented and discussed. This chapter includes a focused analysis of the scores for each measure, while a more general and applied discussion of the significance of the results appears in Chapter 5.

#### *Administration of the Survey Instrument*

The study was deployed during the period from January 21 through January 24, 2011, using the primary contact method of a paper survey instrument delivered by U.S. mail. As described in detail in Chapter 3, the mailing packet included an invitation-to-participate letter, two copies of the Informed Consent statement, the paper survey instrument, the optional form for participating in the incentive drawing, and the stamped, pre-addressed return envelope. The survey packets were mailed out in sets defined by each state, over the course of the four-day deployment period. For each of the 13 states, the total number of survey packets mailed out was comprised of the following three



components: the total number of Appalachian counties, the number of public health districts that included an Appalachian county, and the number of named health educators identifiable as working with a particular county or district within that state. Table 1 lists the total number of survey packets deployed for each state, and the date on which each was mailed. For the study as a whole, a total of 491 survey packets were mailed out.

*Table 1. Survey Packets Deployed By State*

| <b>State</b>          | <b>Survey Packets Deployed</b> | <b>Date Mailed</b> |
|-----------------------|--------------------------------|--------------------|
| <i>Alabama</i>        | 37                             | 1/21/2011          |
| <i>Maryland</i>       | 10                             | 1/21/2011          |
| <i>Mississippi</i>    | 29                             | 1/21/2011          |
| <i>New York</i>       | 16                             | 1/22/2011          |
| <i>North Carolina</i> | 40                             | 1/22/2011          |
| <i>Ohio</i>           | 36                             | 1/22/2011          |
| <i>South Carolina</i> | 7                              | 1/22/2011          |
| <i>Virginia</i>       | 32                             | 1/22/2011          |
| <i>West Virginia</i>  | 57                             | 1/22/2011          |
| <i>Georgia</i>        | 44                             | 1/23/2011          |
| <i>Kentucky</i>       | 62                             | 1/23/2011          |
| <i>Pennsylvania</i>   | 58                             | 1/23/2011          |
| <i>Tennessee</i>      | 63                             | 1/24/2011          |

Simultaneously with the postal deployment of the paper surveys, the secondary method of contact, an online version of the instrument, was made available to respondents, using the Dimension Net (mrInterview) survey software hosted by The University of Tennessee. The online survey was accessible using a specific URL provided in the invitation letters that were mailed along with the paper survey instruments.

In addition, for the local public health departments (LHDs) or districts for which the contact information for the director was available, the online survey's URL was included in the letter of introduction and explanation about the study that was sent to the LHD directors, shortly after the deployment of the paper survey. (See Appendix G for the text of the directors' email.) Multiple directors responded to that email; the content of the responses ranged from providing a head count or even names of the health educators working in a particular county or district, to indications that the email would be forwarded to health educators urging them to complete the survey. One director forwarded the email and URL to the other directors in relevant counties or districts in his state, encouraging those directors to urge their health educators to participate in the study. Judging by the higher participation rates in the states for which directors were contacted, this kind of top-down support was helpful in improving the response rate for the study. In some cases, directors responded that they did not have any health educators or health promotion specialists on their staff, which is also useful for a more accurate calculation of the response rate.

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*Participation in the Study*

Ultimately, a total of 149 complete and valid surveys were completed by respondents, and are the basis for the reported results and statistical analysis described later in this chapter. Response rates varied widely by state, and were adversely influenced by several factors, including variations in individual states' approaches to the allocation of health educators among counties and districts, apparent reductions in funding for health educator positions, a conflict with state level policy, secular events such as unusually severe winter weather in some areas, and even a clerical issue with some of the initial survey packets.

Table 2 reports the proportional contribution of each state to the overall total of 149 surveys, listing both the raw score for each state, and the percentage of the total responses that originated from each state. Kentucky (26.8%) made the largest contribution, in that responses from its health educators comprise over a quarter of the dataset. North Carolina's health educators also figure prominently, contributing about a fifth of all responses. Six of the 13 states – Alabama, Virginia, Mississippi, Maryland, South Carolina, and Pennsylvania -- made only minimal individual contributions to the collective data, as all of these states together represent only 10.7% of the total responses.

*Table 2. Contribution to Dataset by State*

| <b>State</b>   | <b>Raw Score</b> | <b>% of Total Responses N=149</b> |
|----------------|------------------|-----------------------------------|
| Kentucky       | 40               | 26.8%                             |
| North Carolina | 31               | 20.8%                             |
| Ohio           | 20               | 13.4%                             |
| West Virginia  | 13               | 8.7%                              |
| Tennessee      | 11               | 7.4%                              |
| New York       | 10               | 6.7%                              |
| Georgia        | 8                | 5.4%                              |
| Alabama        | 4                | 2.7%                              |
| Virginia       | 4                | 2.0%                              |
| South Carolina | 3                | 2.0%                              |
| Maryland       | 2                | 1.3%                              |
| Mississippi    | 2                | 1.3%                              |
| Pennsylvania   | 1                | 0.7%                              |

Another aspect of each state's participation level in the study is its response rate, or what percentage of the deployed survey packets ultimately resulted in a completed survey. This way of looking at the degree of participation by each state takes into consideration the fact that some states had more opportunity to produce a larger number of completed surveys, because they contain more Appalachian counties or health

districts. Therefore, the response rate reflects to what extent each state fulfilled its potential to contribute to the collective dataset. However, to accurately measure that potential, this analysis must also consider the additional information which emerged from the study, about which counties do not employ health educators, or even circumstances in which a health district employs a health educator who then serves the multiple counties within that district. These are both examples of revealed circumstances which necessitate a reduction in the number of potential surveys that could be considered “completable” for that state (Watt & Van den Berg, 1995). To include these kinds of circumstances, it is helpful to look at the number of deployed survey packets per state as a starting point for computing the potential response rate, but then adjusting that starting point to a different base number that deducts counties or districts that do not have a health educator, and also counts as one unit those counties that are served by the same health educator. In other words, if a health educator who submitted a completed survey indicated in the survey that he or she serves at a district level and serves the three counties within that district, then both that district and the three counties would be counted as having responded to the survey, even though there is only one survey representing all four of those original survey packets that were deployed. Because the survey packets were sent as part of a census method, to ascertain how many health educators are working in the region defined as Appalachia, it would follow that the original basis for a response rate (the total number of survey packets deployed) was merely a basis for a systematic estimate of the population, and it is reasonable to adjust that original estimate in light of findings from the survey.

To compute a reasonable revised base number for calculating the response rate, this analysis will start with the original base of the number of survey packets deployed for each state, then modify that base number according to the information available to date about which packets were deployed to places that do not have a health educator available, and which packets are redundant because a responding health educator serves in multiple packet destinations. This revised base number becomes the denominator of the calculation of the adjusted response rate. The numerator of this calculation becomes the number of packets that can be linked to a completed survey, either through a one to one correspondence, or because the county or district is among multiple locations served by the health educator who completed a survey. The result is the adjusted response rate for each state.

Table 3 below displays the original number of packets deployed for each state, the number of completed surveys, the original response rate based on those two numbers, the revised base number reflecting packets sent to destinations that do not involve a health educator or redundant destinations, the number of packets sent to destinations that can be linked to a completed survey, and the adjusted response rate for that state.

*Table 3. Survey Response Rate by State*

| State             | Total<br>Packets | Completed<br>Surveys | Orig Resp<br>Rate | Adjusted<br>Base | Packets w/<br>Surveys | Adj Resp<br>Rate |
|-------------------|------------------|----------------------|-------------------|------------------|-----------------------|------------------|
| South<br>Carolina | 7                | 3                    | 42.9%             | 7                | 7                     | 100.0%           |
| North<br>Carolina | 40               | 31                   | 77.5%             | 40               | 36                    | 90.0%            |
| Kentucky          | 62               | 40                   | 64.5%             | 62               | 41                    | 66.1%            |
| New<br>York       | 16               | 10                   | 62.5%             | 16               | 10                    | 62.5%            |
| Georgia           | 44               | 8                    | 18.0%             | 34               | 21                    | 61.8%            |
| Ohio              | 36               | 20                   | 56.0%             | 34               | 21                    | 61.7%            |
| Virginia          | 32               | 4                    | 12.5%             | 29               | 17                    | 58.6%            |
| West<br>Virginia  | 57               | 13                   | 22.8%             | 51               | 13                    | 25.5%            |
| Tennessee         | 63               | 11                   | 17.5%             | 56               | 14                    | 25.0%            |
| Maryland          | 10               | 2                    | 20%               | 10               | 2                     | 20%              |
| Alabama           | 37               | 4                    | 10.8%             | 33               | 4                     | 12.1%            |
| Mississippi       | 29               | 2                    | 6.9%              | 3                | 29                    | 10.3%            |
| Pennsylvania      | 58               | 1                    | 1.7%              | 55               | 2                     | 3.6%             |

Although South Carolina contributed only a small number of surveys to the ultimate total, it actually achieved a very high response rate, adjusting for the fact that the three health educators who responded to the survey are collectively responsible for multiple counties, as part of the regional health department structure. North Carolina



health educators demonstrated a very high level of involvement in the study, with only four counties failing to respond to the survey. Ohio required only a small adjustment in its base number, as it does not have district-level health departments, but two counties were specifically identified as not employing health educators. Georgia exemplifies a state for which the adjusted response rate was substantially different from its original response rate (62% vs. 18%), because there were large changes in both the numerator and denominator in the response rate equation. The numerator changed because the eight respondents included health educators who worked for multiple counties within two of the state's health districts. The denominator was reduced by ten because another district and nine of its counties did not employ a health educator. Virginia's Appalachian counties also are generally organized with health educators stationed at the district level, and it experienced a substantial jump in its adjusted response rate as Georgia did, because of a similar combination of effects.

External factors contributed to the low response rates from several of the Appalachian states. Extraordinarily strong winter snowstorms may have been a factor in West Virginia, New York, and Pennsylvania, by causing the cancellation of workdays, interfering with travel, and possibly even delaying the delivery of mail in some locations, as reported by the news media. It is not known if the weather actually impacted these health educators or the delivery of the surveys, but it is reasonable to believe that some may have been affected, along with other people and activities in these areas.

As shown in Table 3, Alabama and Mississippi were two of the states with the lowest response rates, regardless of the method of calculation. These were two of the

three states that were part of the first day's mailings of the survey packets, and may have been adversely impacted by a clerical error made by the researcher, in preparing the survey packets. The survey packets, including the multiple pages of materials described in Chapter 3, were sent out using good quality, self-sealing #10 envelopes. However, within a few days, six of the pre-addressed return envelopes were apparently found loose in the Knoxville Post Office, and were mailed back empty with Knoxville postmarks. The first of these arrived on January 22, the day after the first packets were mailed out. Apparently the packets were too full for the self-sealing adhesive to contain the contents of some of the envelopes, so they did not arrive intact. Assuming there were other envelopes beyond the six known to be affected by this problem, it is possible that some unknown number of health educators in Alabama and Mississippi, did not have an opportunity to participate. The packets mailed out on January 22 and after were all secured with scotch tape, to prevent this problem.

The final factor to consider, which appears to have substantially affected the response rate from Tennessee, is that some health educators from that state indicated that they could not participate in the study without the approval of a health education official at the state level of the Tennessee Department of Health. These statements were subsequently affirmed by the official, via email. Eleven completed surveys had been received from health educators in Tennessee, which accounted for fourteen of the survey packets originally deployed. It is not known exactly how many of the potential Tennessee participants were aware of this policy and were thereby prevented from participating, but it seems likely that it had a negative impact on the response rate for Tennessee. Of the

original 63 survey packets deployed in Tennessee (the most for any one state), 21 could be accounted for: 14 can be associated with one of the eleven completed surveys, two were expressly rejected because of the state policy, and five were returned from counties with no health educators. This leaves 42 of the survey packets originally deployed in Tennessee that may possibly have been affected by this policy. No information about this policy or the procedure for obtaining approval for research could be found on the Tennessee Department of Health's website.

#### *Overall Response Rate for the Study*

In light of the discussion above about the appropriate method of calculating the overall response rate for the survey, both a conventional and an adjusted response rate are provided here. Using the conventional method of dividing the number of completed surveys (149) by the total number of surveys distributed (491), the response rate for the study was 30.3%. (It should be noted that 150 complete surveys were actually submitted, but one was disqualified from inclusion in the study because of a missing consent form.)

Alternatively, the adjusted response rate is higher, and is arguably a more accurate reflection of the rate of response by potential respondents reached by the study, because it accounts for counties and districts that do not have access to a health educator, and it uses a more fair method of counting the situation when a health educator is responsible for multiple counties, or works out of a district level office. Totaling up the state level numbers reported in Table 3, the adjusted response rate is based on the 217 packets directly associated with the 149 completed surveys, divided by the adjusted base number of 430, a calculation which yields a response rate of 50.5%.

*Responses to the Quantitative Measures*

This section reports on the overall results of the study, for each of the quantitative questions on the survey instrument. The survey questions fall into four broad categories: the two screening questions, the five demographic questions, the thirteen content questions, and the two open-ended measures. Note that the results for the demographic question D1, about which state the respondent works in, are reported in the above section of this chapter, because it is a pivotal measure for framing the response rate for the survey. In addition, results for the second demographic question D2, about which county or health district the respondent works in, are not reported here, because this information might allow a respondent to be identified as having participated in the study, given that many counties or districts only employ one or a few health educators. In accordance with the IRB approval of this study, the county/district information was solicited and recorded only for the purposes of tracking the response rate for the study, and determining the economic and health status classification for their responses. The responses to this question were used conservatively in order to protect the confidentiality of the participants.

The first two questions on the instrument were included for the purposes of screening the respondents for their eligibility to participate in the study. The first screening question presented an accepted definition of a “health educator” and asked respondents to indicate whether or not they work as a health educator. In accordance with the study’s screening criteria, 100% of all 149 respondents indicated that they are health educators. In addition, 100% of respondents also answered the second screening question

by indicating that their work setting is a public health department, thus fulfilling the second screening criteria for participation in the study.

*Demographic Question D3. Academic Training or Certification*

Respondents were asked to indicate what academic degrees and/or credentials they have, and in what year the degree or credential was earned, in order to determine how current the training was. Respondents could select as many of the answer options as applied to them. It should be noted that some of the responses originally given by respondents that were entered into the “Other” category were recoded into one of the structured categories, during the process of cleaning the data. About a third of all respondents indicate that their degree is in the most directly related field: health education or health promotion. One of the most surprising findings on this measure is that only 19 of the study participants are CHES certified, and only 21 hold a Masters of Public Health degree. (Many do hold graduate degrees of other kinds, including masters in Health Education or Health Promotion, as well as a doctorate in Public Health.) Another finding of interest is the wide range of academic fields that are represented by the degrees held by respondents. Almost 31% of all respondents hold a degree in a field other than public health, health education, teaching, or nursing. Many of the unspecified degrees were in the biological sciences, social work, exercise science/physical education, nutrition, or other areas that are closely related to public health. However, they also included such wide-ranging fields as business, engineering, mathematics & statistics, and political science.

*Table 4. Degrees and Credentials*

| <b>Degree or Credential</b>                  | <b>Total<br/>n=149</b> | <b>Year Earned: Range</b> |
|--|------------------------|---------------------------|
| Associates (2-year) degree or certification  | 10.1%<br>15            | 1975-2009                 |
| Certified Health Education Specialist (CHES) | 12.8%<br>19            | 1989-2009                 |
| Masters of Public Health (MPH)               | 14.1%<br>21            | 1977-2009                 |
| Teaching degree                              | 15.4%<br>23            | 1970-2007                 |
| Major in Health Education                    | 33.5%<br>50            | 1973-2008                 |
| Nursing degree                               | 26.2%<br>39            | 1969-2009                 |
| Other degree (please specify)                | 30.9%<br>46            | 1971-2008                 |
| No specialized health or teaching degree     | 2.0%<br>3              |                           |

*Demographic Questions D4 & D5. Age and Sex*

The demographic Question D4 provided a blank for respondents to write in their age. These numerical responses were then recoded into four age categories, as reported below. More than two-thirds of the participants are between 30 and 59 years old, while almost 11% are sixty years old or older. The mean age for all respondents is 42.8 years old. The range of ages starts at 23 and extends to 68 years old.

*Table 5. Respondent Age Profile*

| <b>Age Category</b> | <b>Raw Score</b> | <b>% of Total Responses<br/>N = 149</b> |
|---------------------|------------------|---|
| 18 to 29 years      | 25               | 16.8%                                   |
| 30 to 44            | 57               | 38.3%                                   |
| 45 to 59            | 50               | 33.6%                                   |
| 60 and over         | 16               | 10.7%                                   |
| No answer           | 1                | 0.7%                                    |

Regarding gender, only a handful of participants in this study are male. Out of the 149 respondents, 12 are male (8.1%), while 137 are female (91.9%). Because the participants skew so strongly on this measure, sex is not a particularly meaningful variable to include in the analysis.

*Content-Oriented Questions Q1-Q15*

Questions 1 through 4 all focus on characteristics of the respondents' work as health educators, and how often they need to find information in order to do their work.

*Question 1. Frequency of Occurrence of Health Educator Work Activities*

This question asked respondents to indicate how often their work involved each item on a list of activities that health educators commonly engage in. In the table below, the description of the activity has been abbreviated to better fit in the box. (See the

instrument in Appendix E for the full description of each activity.) The frequency scale used for this and several other measures included both a verbal and numerical representation of each frequency level, to minimize ambiguity in the responses. For example, the most frequent (top point) position on the scale was termed “Frequently”, and was quantified as occurring ten or more times per year. The primary finding to emerge on this measure is that health educators do engage in health information seeking for their work, on a very frequent basis; 79% of all respondents indicated that they engage in health information seeking ten or more times per year. This result establishes that information is in fact prominent in their work, and validates the need for the scholarly investigation of their information behavior. The second most frequent activity for these participants is to work with coalitions of other people to meet the needs of their communities, which is a frequent activity for about 68% of the health educators. More than 60% are frequently called upon by community members with health questions. Some of these activities also need to be considered within their own context; for example, although grant writing/fund raising does not rank highly as a “frequent” activity, over 30% indicate that they do engage in this activity three to five times per year, which would indicate that grant writing is a regular activity for health educators.



*Table 6. Frequency of Activity (% and Score)*

| <b>Activity</b>   | <b>Frequently<br/>10+ times</b> | <b>Often<br/>6 to 9</b> | <b>Occas<br/>3 to 5</b> | <b>Rarely<br/>1 or 2</b> | <b>Never</b> | <b>No<br/>Answr</b> |
|---|---------------------------------|-------------------------|-------------------------|--------------------------|--------------|---------------------|
| Delivering a program created by a health authority (CDCP) | 18.8%<br>28                     | 22.1%<br>33             | 22.1%<br>33             | 18.8%<br>28              | 14.8%<br>22  | 3.4%<br>5           |
| Telephone calls from public with health questions         | 61.1%<br>91                     | 16.1%<br>24             | 13.4%<br>20             | 6.0%<br>9                | 2.0%<br>3    | 1.3%<br>2           |
| Assessing community's health needs                        | 36.2%<br>54                     | 20.1%<br>30             | 20.8%<br>31             | 19.5%<br>29              | 2.0%<br>3    | 1.3%<br>2           |
| Developing an original program on health issue            | 37.6%<br>56                     | 25.5%<br>38             | 22.8%<br>34             | 11.4%<br>17              | 1.3%<br>2    | 1.3%<br>2           |
| Evaluating a program's effectiveness                      | 23.5%<br>35                     | 26.8%<br>40             | 28.9%<br>43             | 17.4%<br>26              | 2.0%<br>3    | 1.3%<br>2           |
| Writing grants or other activities to get funding         | 12.1%<br>18                     | 19.5%<br>29             | 30.9%<br>46             | 22.1%<br>33              | 14.1%<br>21  | 1.3%<br>2           |
| Working with coalitions to address community needs        | 67.8%<br>101                    | 17.4%<br>26             | 8.1%<br>12              | 2.7%<br>4                | 2.0%<br>3    | 2.0%<br>3           |
| Looking for health info to assist with these activities   | 79.2%<br>118                    | 13.4%<br>20             | 4.7%<br>7               | 0.7%<br>1                | 0.7%<br>1    | 1.3%<br>2           |

*Question 2. Frequency of Creation of Information Need for Each Activity*

Respondents were then asked to think about the same health educator activities, and indicate how likely it is that engaging in each activity will create an information need, prompting them to consult an information source. The scale is somewhat different for this measure, but again, each scale point is represented as both a verbal concept and a numerical quantity. For example, respondents who indicate that a particular activity “Always” causes them to engage in information seeking are actually saying that for ten

times out of ten that an activity occurs, it will prompt an information need. For this measure, an additional scale point permits respondents to indicate that they do not engage in a particular activity. The concept of “information need” is defined within the question, to also encourage consistency in the respondents’ interpretations of the response categories. Table 7 presents both the percentage of and number of respondents who selected each frequency level, for each activity.

*Table 7. Frequency of Info Need Prompted By Activity*

| Activity  | Always<br>10of10<br>times | Usually<br>6 to 9 | Occas<br>3 to 5 | Rarely<br>1 or 2 | Never<br>0 | Don't<br>Do<br>It | No<br>Answr |
|---|---------------------------|-------------------|-----------------|------------------|------------|-------------------|-------------|
| Delivering program created by health authority          | 16.8%<br>25               | 27.5%<br>41       | 24.2%<br>36     | 12.8%<br>19      | 3.4%<br>5  | 12.8%<br>19       | 2.7%<br>4   |
| Telephone calls from public with health questions       | 9.4%<br>14                | 22.1%<br>33       | 46.3%<br>69     | 19.5%<br>29      | 0%<br>0    | 1.3%<br>2         | 1.3%<br>2   |
| Assessing community's health education needs            | 21.5%<br>32               | 29.5%<br>44       | 31.5%<br>47     | 12.8%<br>19      | 0.7%<br>1  | 2.0%<br>3         | 2.0%<br>3   |
| Developing an original program on health issue          | 30.9%<br>46               | 39.6%<br>59       | 20.8%<br>31     | 3.4%<br>5        | 0.7%<br>1  | 2.0%<br>3         | 2.7%<br>4   |
| Evaluating effectiveness of a program after implemented | 11.4%<br>17               | 30.2%<br>45       | 34.2%<br>51     | 16.1%<br>24      | 2.7%<br>4  | 4.0%<br>6         | 1.3%<br>2   |
| Fielding questions from people attending programs       | 12.1%<br>18               | 22.1%<br>33       | 38.3%<br>57     | 22.1%<br>33      | 1.3%<br>2  | 1.3%<br>2         | 2.7%<br>4   |
| Writing grants or engaging other fundraising activities | 30.2%<br>45               | 24.2%<br>36       | 15.4%<br>23     | 10.7%<br>16      | 5.4%<br>8  | 12.8%<br>19       | 1.3%<br>2   |
| Working with coalitions to address health needs         | 16.1%<br>24               | 30.9%<br>46       | 35.6%<br>53     | 12.1%<br>18      | 2.0%<br>3  | 1.3%<br>2         | 2.0%<br>3   |

The overall message from this measure is that health educator activities often create a need for information and engaging in information seeking. In particular, about 30% of all respondents state that grant writing, or developing an original program, “always” create an information need, and spark a search for information. Two of the activities that the prior measure identified as frequently occurring tasks, appear to create an information need on an occasional basis, but not necessarily always: working with coalitions (36%) and fielding phone calls (46%). It is also interesting to note that very few respondents feel that this list of activities never create an information need for them.

### *Question 3. Proportion of Time Spent on Prepackaged Versus Original Programs*

This question reveals what the respondents’ relative distribution of effort is on delivering prepared programs produced by other entities like the CDC, versus time spent on delivering original programs created by the health educator herself. It was anticipated that having to prepare and deliver original programming would be more likely to trigger information needs and seeking than delivering a prepared program would. This assumption was supported on the prior measure, for which far more respondents stated that original programs were more likely than packaged ones to create an information need “usually” or more often. Question 3 results (presented in Table 8 below) establish that for almost half of these respondents (46%), more time is spent on original programs than on prepackaged ones (20%), while about 30% report that their time is evenly divided between the two types of programs. The results for this measure, taken in the light of the

prior measure's results about program type, help to round out this picture of the prominent role information plays in the work of health educators.

*Question 4. Focus versus Variety in Challenges Addressed by Work*

This question presented participants with two alternative statements, and asked them to pick the one statement that most accurately described the focus of their work as health educators. One statement describes a more focused approach in which a few specific health issues are addressed in a greater concentration of work efforts, while the other described a wide variety of health challenges with which the health educator must contend. For these respondents, the preponderance characterize their work as addressing a variety of health challenges, rather than specializing (see Table 9).

*Table 8. Emphasis on Prepackaged or Original Programs*

| <b>Statement</b>  | <b>Total</b> |
|---|--------------|
| I spend MUCH MORE TIME delivering prepackaged programs (like those from the CDCP) than delivering original programs | 8.7%<br>13   |
| I spend SOMEWHAT MORE TIME delivering prepackaged programs than delivering original programs                        | 11.4%<br>17  |
| I spend about an EQUAL AMOUNT OF TIME on delivering prepackaged programs and original programs                      | 29.5%<br>44  |
| I spend SOMEWHAT MORE TIME delivering original programs than delivering prepackaged programs                        | 18.8%<br>28  |
| I spend MUCH MORE TIME delivering original programs than delivering prepackaged programs                            | 27.5%<br>41  |
| No answer   | 4.0%<br>6    |

*Table 9. Specific vs. General Focus of Work*

| <b>Statement</b>   | <b>Total</b> |
|--|--------------|
| My efforts tend to be focused on addressing a few specific health challenges that are especially prominent in the community I serve. | 38.3%<br>57  |
| My efforts are dispersed across a wide variety of health challenges that exist in the community I serve.                             | 59.7%<br>89  |
| No answer  | 2.0%<br>3    |

Questions 5 through 7 addressed the respondents' feelings about finding and evaluating information related to their work.

*Questions 5 & 6. Self-evaluation of Information Seeking Ability and Information Evaluation*

The first of the two measures asks respondents to rate their ability to effectively find information that they need in relation to their work as a health educator, using a five-point rating scale. These survey participants are confident about their information seeking skills, with about 84% rating their abilities to find information as either excellent or very good. Only one respondent characterized his or her information seeking ability as being inadequate.

Question 6 asks respondents to also rate themselves on their ability to assess the quality of information that they find for their work. An operational definition of evaluating information is embedded in the question, in order to expressly state the key

attributes of information evaluation: reliability, authority, appropriateness and completeness of the information. As with Question 5, respondents rated themselves as having a high level of ability to evaluate the quality of the information that they track down.

*Table 10. Perceived Information-seeking Ability*

| <b>Information-seeking Ability Level</b> | <b>Total</b> |
|--|--------------|
| Excellent                                | 28.9%<br>43  |
| Very Good                                | 55.0%<br>82  |
| Adequate                                 | 13.4%<br>20  |
| Lower than I want it to be               | 0.7%<br>1    |
| Poor                                     | 0%<br>0      |
| No answer                                | 2.0%<br>3    |

*Table 11. Perceived Ability to Evaluate Information*

| <b>Information Evaluation Ability Level</b> | <b>Total</b> |
|---|--------------|
| Excellent                                   | 25.5%<br>38  |
| Very Good                                   | 56.4%<br>84  |
| Adequate                                    | 16.1%<br>24  |
| Lower than I want it to be                  | 0.7%<br>1    |
| Poor  | 0%<br>0      |
| No answer                                   | 1.3%<br>2    |

*Questions 7a, 7b, & 7c. Formal Training in Use of Electronic Information Sources*

This three-part question explored whether or not respondents have had formal training in how to use electronic information sources in order to find information for their professional work. Question 7a presented a yes or no question about having had formal training, and defined electronic information sources as online databases of health information such as WebMD, electronic journal articles, or websites for established health-related organizations like the CDC. The majority of these respondents indicated that they had experienced some formal training (59%, versus about 40% who answered “no”). Respondents who had answered “Yes” to having had formal training, were then presented with Question 7b, while the others were skipped to the unrelated Question 8. Question 7b provides four statements describing the potential circumstances under which these three respondents received their training: as part of getting their academic degree, as professional development training, as both of these, or under other circumstances. On the job training for professional development was slightly more likely to be the source of the formal training for these respondents, while the next most likely setting was a combination of professional and academic sources. For the three respondents who had received their training under other circumstances, two were special programs related to public health.

Question 7c asked the respondents who had experienced formal training in using electronic information resources about how satisfied they were with the training they received. Using a four-point satisfaction scale, more than half of these 88 participants

indicated that they were “Somewhat Satisfied”. Only six of the trained respondents indicated any level of dissatisfaction with the training they had received.

It is interesting to note that, although the responses to the measures about information seeking and evaluation ability, and the experience of formal training, would seem to indicate that the study’s respondents have few issues related to information literacy skills, this finding does not entirely fit with many of the comments provided in the open-ended response questions, which are discussed below.

Questions 8 through 13 address the kinds of actions that the respondents might take in order to find needed information for their work, and what kinds of sources they might use. Question 8 serves to establish what level of Internet access the health educators have available to them for their work. Answer options are some form of high speed access, dial-up access, or no access. All but one of the study’s respondents said that they have high speed Internet access for their work. The one respondent has dial-up access. The fact that virtually all of these health educators working in Appalachia have high-speed access implies that there are no fundamental infrastructure issues preventing them from accessing information sources available on the Web. However, once again, the open-ended responses reveal that there are other layers of complexity regarding the quality of access to online information.

#### *Question 9. Frequency of Use of Information Sources*

This question applies the same frequency scale used for the health educator activities in Question 1 to a varied set of potential information sources that health educators could consult, in the event that an information need arises. The most prominent



finding from this question is that Internet-based sources, such as general Web searches, and the websites of respected health organizations, are the most frequently chosen information sources. Many respondents also will at least occasionally consult a healthcare professional as an interpersonal source of information. One of the more surprising results is that these respondents are more likely to consult printed information sources from a library, rather than electronic health information from a library. This may reflect access more than user preferences, however. The one information source in this list which plays the smallest role in their information environments is obtaining assistance from a medical or health librarian; 89% of respondents state that they rarely or never have used this source. No respondents filled in another kind of information source that was not included in the list.

*Table 12. Frequency of Using Information Source*

| <b>Information Source</b>   | <b>Frequently<br/>10+ times</b> | <b>Often<br/>6 to 9</b> | <b>Occas<br/>3 to 5</b> | <b>Rarely<br/>1 or 2</b> | <b>Never<br/>0</b> | <b>No<br/>Answr</b> |
|---|---------------------------------|-------------------------|-------------------------|--------------------------|--------------------|---------------------|
| Consulting medical or reference books you own                       | 13.4%<br>20                     | 16.8%<br>25             | 27.5%<br>41             | 30.2%<br>45              | 10.1%<br>15        | 2.0%<br>3           |
| Asking doctor, nurse, or other healthcare professional              | 20.8%<br>31                     | 26.2%<br>39             | 31.5%<br>47             | 18.8%<br>28              | 1.3%<br>2          | 1.3%<br>2           |
| Searching websites for health organizations like CDC or ACS         | 71.1%<br>106                    | 20.8%<br>31             | 6.7%<br>10              | 0%<br>0                  | 0%<br>0            | 1.3%<br>2           |
| Printed resources available from medical, health, or public library | 24.8%<br>37                     | 18.8%<br>28             | 22.8%<br>34             | 21.5%<br>32              | 10.7%<br>16        | 1.3%<br>2           |
| Asking medical/health librarian for assistance                      | 0.7%<br>1                       | 2.0%<br>3               | 6.7%<br>10              | 24.2%<br>36              | 64.4%<br>96        | 2.0%<br>3           |
| Searching for information available on the Internet                 | 83.2%<br>124                    | 12.1%<br>18             | 3.4%<br>5               | 0%<br>0                  | 0%<br>0            | 1.3%<br>2           |
| Using library's electronic databases of health information          | 8.7%<br>13                      | 9.4%<br>14              | 16.1%<br>24             | 28.9%<br>43              | 35.6%<br>53        | 1.3%<br>2           |
| Other information source  | 0%                              | 0%                      | 0%                      | 0%                       | 0%                 |                     |

*Question 10. Satisfaction Level for Various Information Sources*

This question uses the same resource list as in Question 9, but the scale for measurement is a four point satisfaction scale, with a fifth option for indicating if the respondent has never used that resource at all. These health educators gave the highest satisfaction rating to the websites for esteemed health organizations, such as the Centers for Disease Control, followed closely by general searching on the Web. Using a health professional as an interpersonal information source was also highly satisfying. This question clearly reveals that the preponderance of these respondents have never sought the assistance of a medical librarian, and almost 40% of them have never used electronic health information from a library. In contrast, almost three-fourths of participants have been satisfied with their use of printed information from a library.

*Table 13. Satisfaction with Using Information Source*

| <b>Information Source</b>   | <b>Very Satisfied</b> | <b>Satisfied</b> | <b>Dis-satisfied</b> | <b>Very Dissatis</b> | <b>Never UsedIt</b> | <b>No Answr</b> |
|---|-----------------------|------------------|----------------------|----------------------|---------------------|-----------------|
| Consulting medical or reference books you own                       | 15.4%<br>23           | 62.4%<br>93      | 5.4%<br>8            | 1.3%<br>2            | 12.1%<br>18         | 3.4%<br>5       |
| Asking doctor, nurse, or other healthcare professional              | 26.8%<br>40           | 63.8%<br>95      | 1.3%<br>2            | 0%<br>0              | 5.4%<br>8           | 2.7%<br>4       |
| Searching websites for health organizations like CDC or ACS         | 39.6%<br>59           | 55.0%<br>82      | 1.3%<br>2            | 1.3%<br>2            | 0%<br>0             | 2.7%<br>4       |
| Printed resources available from medical, health, or public library | 12.1%<br>18           | 60.4%<br>90      | 6.0%<br>9            | 1.3%<br>2            | 17.4%<br>26         | 2.7%<br>4       |
| Asking medical/health librarian for assistance                      | 4.7%<br>7             | 24.2%<br>36      | 2.7%<br>4            | 2.7%<br>4            | 61.1%<br>91         | 4.7%<br>7       |
| Searching for information available on the Internet                 | 38.3%<br>57           | 57.7%<br>86      | 1.3%<br>2            | 0%<br>0              | 0%<br>0             | 2.7%<br>4       |
| Using library's electronic databases of health information          | 10.7%<br>16           | 41.6%<br>62      | 3.4%<br>5            | 2.7%<br>4            | 39.6%<br>59         | 2.0%<br>3       |
| Other information source  | 0%                    | 0%               | 0%                   | 0%                   | 0%                  |                 |

*Question 11. Favorite Information Source*

This question again used the same information source list as the prior two questions did, but respondents were asked to indicate which one source they would be most likely to use first when they experience a work-related information need. Once again, the Web proved to be the favorite source for these respondents, as more than half selected the websites of respected health related organizations, like the CDC or the American Cancer Society, while one-third indicated that a general search on the Internet would be their default choice. These responses fit well with the other measures, given that these resources were among the most frequently used, and the most satisfying sources, on the prior two questions. Two respondents selected the “other information source” as their favorite, then wrote in what source they were referring to. For one, it was an interpersonal source, consisting of people who had already experienced a particular problem. One example of this would be consulting with a former victim of domestic violence, as part of the preparation for developing a new program on preventing domestic violence. The other filled-in source was actually several different ones, including consulting with colleagues or community partners, or referring to in-house data and statistics. Table 14 displays the percentages and incidence levels for respondents who selected each source as their first choice of information source.

Table 14. First Choice of Information Source

| <b>Information Source</b>   | <b>Incidence Level</b> | <b>Total</b> |
|---|------------------------|--------------|
| Consulting medical or reference books you own                       | 8                      | 5.4%         |
| Asking doctor, nurse, or other healthcare professional              | 8                      | 5.4%         |
| Searching websites for health organizations like CDC or ACS         | 77                     | 51.7%        |
| Printed resources available from medical, health, or public library | 2                      | 1.3%         |
| Asking medical/health librarian for assistance                      | 0                      | 0%           |
| Searching for information available on the Internet                 | 48                     | 32.2%        |
| Using library's electronic databases of health information          | 2                      | 1.3%         |
| Other information source  | 2                      | 1.3%         |
| No answer   | 2                      | 1.3%         |

*Question 12. Frequency of Use of Library-based Resources*

This question employs the same frequency scale already used for this study, but it adds a column for “No access” in the event that a health educator’s situation precludes him from using a particular kind of library or source from the library. The list of resources covers two dimensions of library-based resources: on site vs. electronic access, and the specific type of library (medical/academic, public, community college). For these health educators, their level of use of library-based resources is very low (see Table 15 below). The extent of their use of library resources is that about a quarter of the respondents indicate that they access the electronic resources of either a medical or public library, but only about once or twice a year.

Table 15. Frequency of Using Library-based Resources

| <b>Library Resource</b>   | <b>Frequently<br/>10+times</b> | <b>Often<br/>6 to 9</b> | <b>Occasion<br/>3 to 5</b> | <b>Rarely<br/>1 or 2</b> | <b>Never<br/>0</b> | <b>No<br/>Access</b> | <b>No<br/>Answr</b> |
|---|--------------------------------|-------------------------|----------------------------|--------------------------|--------------------|----------------------|---------------------|
| Visit health/medical library in person                                | 1.3%<br>2                      | 0.7%<br>1               | 2.7%<br>4                  | 12.1%<br>18              | 50.3%<br>75        | 31.5%<br>47          | 1.3%<br>2           |
| Access electronic resources of health/medical library                 | 4.7%<br>7                      | 6.0%<br>9               | 6.7%<br>10                 | 26.2%<br>39              | 40.9%<br>61        | 14.1%<br>21          | 1.3%<br>2           |
| Visiting a public library that has health/med resources               | 1.3%<br>2                      | 1.3%<br>2               | 9.4%<br>14                 | 22.8%<br>34              | 51.0%<br>76        | 12.1%<br>18          | 2.0%<br>3           |
| Access electronic resources of a public library                       | 2.7%<br>4                      | 2.0%<br>3               | 6.0%<br>9                  | 26.2%<br>39              | 52.3%<br>78        | 8.7%<br>13           | 2.0%<br>3           |
| Visiting community college library with health resources              | 0.7%<br>1                      | 0.7%<br>1               | 3.4%<br>5                  | 12.1%<br>18              | 64.4%<br>96        | 17.4%<br>26          | 1.3%<br>2           |
| Access electronic sources of community college library                | 1.3%<br>2                      | 0.7%<br>1               | 4.7%<br>7                  | 10.1%<br>15              | 66.4%<br>99        | 15.4%<br>23          | 1.3%<br>2           |
| Asking health/med librarian in person for help                        | 0.7%<br>1                      | 0.7%<br>1               | 4.7%<br>7                  | 14.8%<br>22              | 61.7%<br>92        | 16.1%<br>24          | 1.3%<br>2           |
| Using email, phone or chat to ask health/med librarian for help       | 2.7%<br>4                      | 2.7%<br>4               | 4.0%<br>6                  | 10.7%<br>16              | 66.4%<br>99        | 10.7%<br>16          | 2.7%<br>4           |
| Visiting or accessing electronic resources of another kind of library | 5.4%<br>8                      | 1.3%<br>2               | 2.7%<br>4                  | 16.8%<br>25              | 57.7%<br>86        | 10.7%<br>16          | 5.4%<br>8           |

In contrast, at least half of the participants note that they never access the resources on this list. More than 30% do not have onsite access to a medical library, and 66% have never tried one of the remote reference methods of contact (email, phone, or chat reference). The results for this measure lead to the question of why health educators are not using library resources very much: do the results here understate the barriers to access that might preclude their use? Is it more an issue of awareness rather than access

issues? Or is it a case of the primacy of more convenient sources from the Web taking precedence over high quality but less accessible library-based sources, given the busy work schedules and time pressures health educators face, particularly in Appalachia?

*Question 13. Reaction to Statements Made About Information Needs & Sources*

This question was designed to measure the attitudes of respondents on a range of topics related to their information behavior. A four point Likert scale was used to eliminate a neutral position, so that even subtle valences in the respondents' attitudes would register as either positive or negative toward the statement. The content of these statements was inspired by the comments made by other health educators in formative research for this study. The full range of responses to each statement is presented in Table 16 below.

Several interesting themes emerge from the participants' reactions to these statements. The Internet's importance as a source of information for these health educators is again confirmed by the overall reaction to several of the statements. More than 90% of respondents agree that a general Internet search is an appropriate response for learning about an emergent health issue. Although a majority agrees that they limit their online research into health topics to familiar websites, 35% disagree with this statement, implying that they feel comfortable exploring unfamiliar websites, and evaluating the quality of their information.

Table 16. Reaction to Statements About Information

| <b>Statement</b>   | <b>Strongly Agree</b> | <b>Agree</b> | <b>Disagree</b> | <b>Strongly Disagree</b> | <b>No Answer</b> |
|--|-----------------------|--------------|-----------------|--------------------------|------------------|
| When I hear about a new health issue, I do general Internet search to learn more about the topic   | 41.6%<br>62           | 51.0%<br>76  | 5.4%<br>8       | 0%<br>0                  | 2.0%<br>3        |
| I limit my health info seeking for my work because I am not a medical professional like a doctor or nurse                                | 1.3%<br>2             | 12.1%<br>18  | 38.3%<br>57     | 42.3%<br>63              | 6.0%<br>9        |
| Internet access to health info resources at workplace is not adequate to meet my info needs  | 4.7%<br>7             | 14.8%<br>22  | 47.7%<br>71     | 30.2%<br>45              | 2.7%<br>4        |
| When I research a health topic online, I restrict my search to specific websites that I am very familiar with                            | 14.8%<br>22           | 47.7%<br>71  | 30.9%<br>46     | 4.0%<br>6                | 2.7%<br>4        |
| If I can't find the health info I need for my work, getting the help of a health/medical librarian is a good alternative                 | 4.0%<br>6             | 50.3%<br>75  | 29.5%<br>44     | 10.7%<br>16              | 5.4%<br>8        |
| I am interested in learning more about using information technology that would make it easier for me to serve my community               | 29.5%<br>44           | 55.7%<br>83  | 10.1%<br>15     | 2.0%<br>3                | 2.7%<br>4        |
| When I use a library, I prefer working with printed materials like books and journals over using their electronic journals and databases | 3.4%<br>5             | 22.8%<br>34  | 50.3%<br>75     | 19.5%<br>29              | 4.0%<br>6        |

About 78% feel that their Internet access to health information sources is adequate to meet their information needs. Considering that all but one respondent has high speed Internet access, this implies that almost 20% of respondents have some kind of complaint with their Internet access that is not about bandwidth.

A second theme is that many of the health educators in this study are open to learning about information technology that can facilitate their work. In addition, about 80% feel they should not be constrained in their health-related information seeking, simply because they are not necessarily medical professionals. An interesting sidelight to this statement is that several respondents wrote in the margins of their surveys that they actually are medical professionals, as well as health educators. Given that about a quarter of all respondents hold nursing degrees, and several others possess degrees related to the allied health professions, such as nutritionists, exercise scientists (also physical trainers), and counselors, this statement may be becoming less relevant to the health educator experience.

Another interesting result from the statements question concerns using a health librarian to help the health educator find needed information. A little more than half of the respondents agreed with this statement, but almost none agreed strongly, while a substantial number disagreed. Interacting with a librarian did not score particularly highly on other measures of actual behavior. It cannot be determined from this measure whether the disagreement with the statement stems from a lack of access to medical librarians, or limited experience in exactly how they might be helpful, but this is an area that calls for more study. Reaction to the final statement, about a preference for using print materials at



the library rather than electronic ones, supports the preference for electronic resources that was evident from other measures. However, it is worth noting that about a quarter of all respondents agreed with the statement that they prefer to work with the print resources. This viewpoint may be interpreted as meaning that most respondents prefer to use electronic sources most of the time because they are usually working remotely, but that for some, if they decide to actually visit the library in person, it might be to access a print source not otherwise available. Or, for that segment of the participants, it may reflect a preference for reading in print, even if remote access is preferred to be electronic.

#### *Question 14 & 15. Open-ended Responses*

The final measures of the survey instrument are two open ended questions, which encouraged respondents to express their thoughts in their own words. In this study, the open ended responses contributed both some additional context and explanation for some of the answers to the quantitative measures. However, the open-ended responses also served to introduce multiple concepts related to the health educators' information behavior and environment, which go beyond what was anticipated by the structured survey. The "voices" of some of the participants, as heard in these two measures, lend further support for a conceptualization of the health educators' information environments as being active and evolving settings, with a number of complex, time-sensitive information needs, but plagued with some frustrating limitations on their access to the best sources.

The comments associated with each question have been analyzed separately, although the summary discussion below melds the themes to allow one common narrative to emerge. For each question, each individual comment was assigned one or more codes, to identify all of the various thematic content each comment contains. The comments were then grouped together appropriately, according to the individual concept facets each comment contributes to, in order to provide a sense of the prevalence of their ideas.

The following points summarize the key findings from both open-ended questions. The detailed findings and sample comments for each question are then presented after the summary discussion.

Health educators have a great need for data, not just information. They need this data for both grant writing and for conducting community health assessments, which guide their program development and other activities. One of the obstacles to their obtaining the needed data is that organizations in the community (assumed to be law enforcement, hospitals/medical, and social welfare agencies) do not necessarily keep adequate records, and they do not always share the data they have.

Although most are confident in their information literacy skills, they don't have a lot of time to search for good information sources, and to evaluate them. They would really like some good portals to vetted, specialized resources that are tailored to their various needs.

Many would like more training in how to use information sources, but training that takes them away from their work and accrues travel expenses is not feasible in this economic climate. Convenient, on demand trainings such as webinars or online learning

modules would be better. However, some respondents expressed a preference for hands-on training, implying an onsite instructor, so it is possible that web-based training may not answer their needs.

Although they have high speed access, their ability to access online information is often hampered by filters, or governmental IT use policies. They often cannot access social media, or websites that contain vital health information because filters prevent the use of health keywords that might also be used to search or access inappropriate websites. This is a significant barrier for their information seeking.

One major information need is for access to proven, evidence-based programs that address common health issues, so they can eliminate duplication of effort by developing new programs when good ones already exist.

They are eager to learn about social media, so they can use these tools to reach their communities with their health messages. Respondents who have worked in the field for years are proficient using conventional office software applications but they don't necessarily understand how to use newer media. Using social media may also call for policy changes, as their use is sometimes banned by state employees using government networks to access the Internet.

Health educators need to have better ways to evaluate information they obtain from Web searches, especially because they have little time to spend on careful searching and evaluation. One asked for a rating scale for the quality of medical resources. Portals that link to the kinds of information and educational resources that they frequently need would minimize this aspect of information seeking, but there is a sense that at times they

will need to conduct more open Web searching, and will need to be able to evaluate this information quickly and effectively.

These health educators place a high value on access to information technology and information sources, and feel it enhances the quality of their work. They are very concerned about keeping up to date on the health topics that they deal with, and providing their communities with the best possible information and support.

#### *Detailed Findings for Open Ended Questions*

Q. 14: What kinds of information-related sources, technology, training, or other resources would make it easier for you to do your work as a health educator?

Ninety-three respondents (which is 62.4% of all respondents) chose to answer this open-ended question, and their collective responses yielded a total of 121 conceptual statements. The most prevalent theme coming out of this question were requests for training about how to search for information, or to use information sources or information technology effectively; about 21% of the respondents who answered this question wished for this kind of training. Among the respondents seeking information-related training, there were two schools of thought on the delivery of the instruction; there were more requests for web-based training, because it is more convenient, and it avoids travel expenses, which can prohibit participation, in today's economic climate. However, there were some participants who specifically wanted in-person, "hands-on" training, which they felt would lead to more effective learning. A few comments in this area make the point that many of these health educators have been in their positions for many years; the information environment they were originally trained in has changed dramatically.

- . “I probably would benefit from learning to use resources that I don't use now. I am very dependent on using the computer for research - as the one health educator in an eight office district, I have to do what I do fairly rapidly.”
- “ I feel that technology has surpassed my skills during my 21 year career. I feel inadequately trained in research. But I do try to do it as best I can. So training in online research and info on specific medical journal resources or sites would help.”
- “Training on how to access library resources on line would be helpful.”
- “Formal training regarding searches, shortcuts others have found helpful, or "tricks of the trade.”

The next most prevalent concept in these comments is about having improved access to the Internet or Web content, an issue which was mentioned by about 17% of people who answered this question. Specific comments in this area include pleas for changes in governmental filters on web content, or restrictive policies that block legitimate health-related keyword searching by health educators, or bans on the use of social media for communicating health messages to communities. Other comments in this area wish for access to the electronic journal collection of a medical or university library.

- “The state restricts some programs which [would] allow us to see some graphics (Robert Wood Johnson Foundation is an example). This is [a] deterrent. I was writing a grant and they allowed me access [to] Adobe Flash Player 10 that would allow me to view maps on county health rankings but have restricted that again”.
- “As a public health employee I find that sometimes access to certain websites is blocked. For example, I am a certified diabetes educator and frequently articles on impotence are blocked. This is a common complication of diabetes.”
- “Access is available to the Internet, but it is frowned upon if we use it. Our access to the Internet is monitored, so therefore limited. I wish there was a way we could have access to CDC and certain medical websites only. That would make us feel more free to obtain information, rather than fear we are going to "get in trouble" for being on the Internet.”

- “Being able to access[a] medical library electronically.”

Another popular theme in answer to this question was to ask for a professional-development type of training, about specific topics of interest, mentioned in about 12% of responses. Some of the topics respondents mentioned include specifics like aspects of healthy homes, legislation updates, best practices, and web communication. Others made general requests for webinars or free local training on a range of relevant topics, to keep them up to date as professionals.

- “Training opportunities (additional) webinars on various health education topics offered several dates/times for flexible scheduling.”
- “A training on how to convey health information on our website would be helpful.”
- “Webinars are always great, current and fast moving information. Trainings such as one day conferences updating on legislative policies or best practices are very helpful as well.”

About 12% of respondents expressed a desire for specialized web portals to access online information of interest to health educators or public health. Appalachian health educators are very busy, and may lack the time to search well for information. Portals to vetted, appropriate, and up to date sources, or pathfinders on topic areas of interest, are a solution to streamline their health information-seeking.

- “Have an online database where you can locate lots of information on one site for health educators.”
- “Would be helpful to have a list of websites that my employer and CDC would like me to use - reliable, peer reviewed sites.”
- “A site dedicated solely to trained Health educators. Our needs are often unique. Our approach is required to be different than a doctor or others.”

Some respondents seek access to successful health education programs or materials, which are evidence-based, meaning that they are known to be consistent with health or medical research findings, and produce measurable results (about 10%). These health educators are trying to avoid duplication of effort, or reinventing the wheel, simply because they do not have access to a proven relevant program.

- “Also a list of creative websites to see and share new health education programming. Why re-invent something if there are great programs out there that work!”
- “1. Provide proven curriculums/programs to use. 2. Have brochures, fact sheets to provide [to] the public. 3. Have powerpoint presentations done/approved for use.”
- “ I would like to be able to find other projects which are similar in demographic to the projects we are working on in my county. For example, it would be nice to be able to search for another program which is working on constructing a bike path in a rural area to connect communities. Or what other counties are helping farmers prepare for local institutions' buyers (getting local food in schools). This could be a special network site or library site.”

Another theme to emerge from the open-ended responses to this question is that some participants would like to have a better way to evaluate the quality of information that they find on the Web. Another variant of this theme also acknowledges the problem of information overload, as a complicating factor in sorting out the best quality information to use.

- “I find a lot of conflicting information on there when I'm looking for the current recommendations on things such as how frequently to be tested or screened for a chronic disease, etc. I probably need to know which are trusted sources.”
- “I have the information I just don't have time to review it all.”

- “Knowing which web sites are recommended and reliable as research & scientific based.”
- “A dream would be to have some type of rating system that helps you quickly know if content is good.”
- “Have been health educator (school and public health) for 30+ yrs, fairly satisfied with resources available, primarily via web sites that I bookmark. Challenge is info overload, narrowing down or simplifying for consumers, many health literacy challenges.”

In addition to information, about 9% of the health educators who answered this question expressed a need for data or statistical information, particularly in relation to their local counties and communities. These data are used to fulfill one of public health’s intrinsic functions, surveillance of the health status of their communities, for needs assessment and program planning. They also emphasized that these data are important for writing grant proposals.

- “We need more statistical data, especially when the topic is rape or sexually transmitted diseases. The statistics need to be county specific. These are very difficult to find, even when we contact law enforcement or hospitals. This makes our job harder and limits our grant applications.”
- “[My state] does not gather comprehensive health statistics like other states, especially [for] rural counties.”
- “The largest issue I face is easy access to statistics - especially when we need them for grant-writing.”

Five percent of comments specifically expressed a wish for training about how they could use social media for health promotion messages, and communicating with their community members, as well as obtaining useful and attractive content. In some cases, granting this wish will require policy changes about permitting access to social media for users of state-sponsored networks.



- “ Working for a county health dept, websites like YouTube and Facebook are blocked. Being an educator, I give a lot of presentations to the community and don't have access to popular media outlets that would help to liven up presentations through these media outlets. The same is true for certain online images being blocked. While not a traditional way to find and share info with populations -- using pop culture references to engage an audience is highly effective.”
- “Training on use of social media to deliver health education is needed by me and fellow health educators, especially us older nurses who do not use social media. it is a ‘foreign language’ even though I am very comfortable with computers and software such as Word, Access, and Excell.”
- “Would like more training on developing Facebook pages and Twitter messaging to push out health messaging to community members. If CDC could have short messages updated weekly, we could put these on our web and Facebook pages. E.g., ‘weekly tip to maintain a health weight’ with a web resource to refer people. For more info, go to www...”

About 6% of responses emphasized the funding problems these health educators face, and how limited funding impacts the informational aspects of their work. Journal subscriptions and offsite training that accrues travel expenses are two items that have been targeted by budget-cutting administrations.

- “Medical-nursing journal articles cost money to access, so I don't always get to read the articles. Being able to access medical library electronically”.
- “Lack of resources preclude attendance at national conferences.”
- “In the current economy, free online trainings have been the most feasible and accepted by administration. Anything that this an additional cost or distance traveling to be trained is likely it won't be approved by the Board of Supervisors. We have also eliminated any journals or "extras" to cut the budget.”

Four of the comments pertained to information that arises through interpersonal communication, such as collaboration with peers, or networking with colleagues and

regional supervisors. As one respondent mentioned, the rural, isolated nature of many Appalachian counties sets up additional obstacles.

- “Live in a county that is very rural without many resources. Rely a lot on information resources found online as well as networking with colleagues and experts for information. This has proven to be effective and reliable, however new avenues to explore and expand information gathering are always helpful.”
- “I also, collaborate with other health educators that have like goals to address.”
- “I think that we need more hands on training where we can meet in a central location so we can network with our peers.”

Over 80% of the responses to this question described at least one informational element that was in need of improvement, in order to facilitate these health educators’ work. However, about 12% of the responders to this question expressed satisfaction with this dimension of their professional lives, and indicated that they felt no improvement was needed. A few respondents were content because they perceive that their particular positions involve only a minimal role for searching for information. However, most of the comments in this area indicate that their particular circumstances or governmental agencies, provide superior information access (and assumably adequate training in how to use these sources), in comparison to the situations described by most respondents on this measure. These kinds of comments describing more satisfactory information access help to reinforce the importance of information access and literacy for health educators, and demonstrate that it is an achievable goal. For example, the first comment about Ohio is especially interesting, given that, from the perspective of information science, Ohio has

been a recognized innovator in networked electronic information access for academic libraries.

- “Ohio has very good information-related sources. ODH has an information warehouse that is very good. The community Tool Box is a site that I use. Another is healthfinder.gov from the US Dept of Health and Human Services.”
- “We have a public library which has general information and Internet services. My office has Internet services. I can usually find most of what I need on the CDC websites. WebMD is another site with useful information. The State [West Virginia] also has trainings and webinars to help with teaching.”
- “I honestly have no complaints. I work in a health dept that is able to provide any resource I need to get my job done! I'm very fortunate!! [drew happy face].”
- “I do not have a problem finding information. I use a variety of sources for my research. Generally I start with a search on CDC or APHA. If I reach a dead end I will ask the advice of a medical professional (nurse, doctor) for how to find more info on a particular topic.”

Miscellaneous concepts comprise 7% of the responses to this measure, almost all of which were very specific information resource needs, including Spanish-language materials for distribution to community members, print resources, or access to personal stories (presumably “survivor” stories of individuals who had overcome events or circumstances similar to those faced by community members, that support the theme of a program or campaign). One respondent in this category described the atypical nature of her health educator position.

- “Most of the questions in this survey do not apply to me. I am a health educator working as a communications specialist - receiving requests from the media for an interview, preparing our spokesperson with main points, creating brochures/fact sheets (source materials usually from CDC or similar trusted source), editing materials into plain language and doing similar work for our preparedness efforts.”

Q. 15: Is there anything else you would like to say about the information-related aspects of your job?

This “open mike” question allowed for more free-ranging and spontaneous responses from the 56 participants who chose to answer it. (Note that 21% of these responses simply indicated that they did not have anything to say on this measure.) Respondents primarily used this opportunity to comment on how they use information, to describe specific aspects of their responsibilities, to mention how information technology has enhanced their work, and to complain about problems they have with specific types of sources. To a lesser extent, responses to this question emphasized the rural dimension of their practice, or they reinforced some of the same themes that were expressed on the first open-ended question, such as: the need for training and freer access to Web technologies, reliability of information, and opportunities for networking.

Twenty-one percent of participants who responded to this question mentioned some aspect of information technology’s impact on their work, including their need for or appreciation of technology-enhanced solutions for accomplishing their work.

- “I am fortunate to have high speed Internet access and to work in a technology supported environment. Good luck and best wishes! [happy face].”
- “Things have really changed rapidly during the years I've been working as a health educator. All of my files were paper-based for years, and I've only had computer access for about the past ten years, but it makes it much easier to get a wide variety of health information.”
- “People are demanding more online resources. Text 4 Babies is a big hit. People are on the go and seek health info that works with their lifestyle.”
- “I am accustomed to using CDC websites for the most current guidance and patient information.”

- “Websites, social networking, and various other technology currently used to reach population to be served as well as other venues.”

Another theme emerging from the comments for this open question is that health educators use and need information and data that are up to date and easily obtained.

Fourteen percent of the individuals who answered this question shared thoughts about these two important qualities: timeliness and ease of use.

- “The Internet search option is a wonderfully fast way to access resources that would otherwise be unavailable. I wish there were a way to have access to my previous institution's academic libraries (for research) so I can access scholarly journal articles. Thank you for taking the time to research this interesting topic! [happy face].”
- “Sometimes it is hard to stay updated on new health related topics due to limited time.”
- “Keeping current and up to date on the latest fads such as diets, exercise programs, and substance abuse fads are EXTREMELY important. There is nothing worse than a health professional who does not possess ‘street knowledge’.”
- “It would be nice to have a portal all health departments could share their resources and findings on topics.”

A similar proportion of responses to this question (13%) described problems with accessing specific sources of information, data, or materials needed for their work.

Access issues can reflect the physical unavailability of the desired information, such as not having a medical library nearby, or needing country data that is not even being compiled as it should be, by other agencies. These comments also bring to mind usability issues, such as web design that needs improved functionality, or greater efficiency for searchers in a hurry. Issues with process can also create barriers between the participants and what they need to inform their work. For example, the first comment alludes to

communication problems with other agencies, while another comment describes a procedure for sharing graphic materials.

- “Even though this is the age of technology many people in our area still do not use it as a tool for business or education. I at times have difficulty in getting info more clearly stated from the professionals (i.e. HUD, EPA, etc) to give folks answers that are clearly black/white, not gray areas. It's hard to convince people to do things correctly when they feel there is a catch in what you are communicating.”
- “Most of the time you do not have a lot of time to spend "researching" anything, so you find what you can on the Internet and consult coworkers and medical authority.”
- “There is a lot of red tape involved if I want to share printed materials. I must go through a materials review process to use existing material, and work with the art dept to create new material. This is a very slow process and a major barrier to materials development.”
- “Not to put the CDC down because they have an excellent website, but frequently I have searched for a topic and found information for it on the website. Searching further I may run across a specific website reference somewhere that takes me to another CDC page/section that contains much more information I'm interested in. I don't know why my original search on the site didn't bring up the further information. I seemed to need to enter the exact site to find that new information.”
- “ For grants and other things that I need statistics for, I need county specific data. Sometimes this is hard to find”.
- “Have no medical library close by that I have access to. I would use it if I could.”

As with the first open-ended question, some respondents (9%) chose to continue their plea for improved access to important web content that is currently filtered or banned by technological and/or policy barriers.

- “Public Health Agencies MUST make social media tools accessible for health educators. We are BLOCKED from using twitter, fb, blogs, etc. We are partnering with people in the community to help us get information OUT... but feel it is important for US to be networked in order to monitor and engage in the conversations and fully utilize this resource that grows, and grows, and grows!”

- “Would like to have less websites blocked from the state.”

Some respondents (5%) focused on the fact that they are working in a rural setting, with its unique health issues, and additional challenges for obtaining information. The rural setting underscores the need for local data, relevant and current information, and the their dependency on the Internet.

- “Health issues that are related with rural living. Most materials focus on urban living.”
- “When you work in a rural setting sometimes all we have to go on is internet information. The CDC is great but limited. We need local organizations to do a better job at keeping records and maintaining ongoing statistics”.
- “We are a very rural, isolated county in Appalachia. It is very important we have accurate, up to date information for our community. I am a public health nurse and do teaching daily on a wide variety of subjects. The Internet has been a real help.”

This question also drew a few (5%) thoughtful responses about the value of an interpersonal information source: networking with colleagues, directors, or coalition partners. Both of these comments reflect participatory, community-based health education approaches, which are especially valuable when there is a strong local culture in the community served by a health educator.. The first comment also suggests an evolving, proactive approach to health education which aims to change the community environment in ways that will support public health efforts to change the community members’ health behaviors. This study did not specifically address information behavior within the context of community-based or environmentally-focused approaches to health education, but these comments suggest that these are areas to explore more directly in future research.

- “Most health educators in my area are working on environmental system changes and policy development to improve health behaviors. We do very little "health teaching" in terms of addressing classes. Most of the health info we share in is terms of infrastructure so that health choices become the default choice. Often times we are seeking info beyond the typical health resources, and seeking information related to other disciplines or professions. I have had to learn a lot [from] farmers, school food service, construction management, local government, and legal services.”
- “I often rely on people in my community coalition as sources of local information. I usually learn more from them than I can read in any book - especially about important parts of local history, who works well with whom (or doesn't), what the local culture of our region is and what are the best ways to approach community members with new information so that it will feel relevant to them.”

Some respondents (5%) used their open mike to emphasize the importance of using reliable information sources. Coupled with the related responses to the first open-ended question, the reliability of the information they use is an important concern for these respondents.

- “Of course it's very important to use reliable websites and sources.”
- “Most of the health related information that I give to clients comes from a reliable source.”

A few respondents (4% of those answering the question) addressed a theme that was prominent in the first open-ended question: the need for more training in areas related to their work.

- “My experience is that most health educators do not know how to read research and do not look at enough data.”
- “We need more training in a variety of health education topics and need to meet more with our state / regional directors so we can learn what they are doing.”



- “I like to have more trainings online, but don't.”

### *Results of the Hypotheses Tests*

Twelve hypotheses were developed, based on formative research with other health educators, extensive reading of the academic and professional literature about health educators and their activities, and a consideration of how the Appalachian setting might influence the results of the survey. This section presents the results of the statistical testing of each of the hypotheses, along with an analysis of the meaning of the results. Hypotheses 1 through 3 relate to the research question about health educators’ perceptions of their information needs. Hypotheses 4 through 6 address the respondents’ perceptions of their ability to find and evaluate information. Hypotheses 7 through 9 explore the research question about the respondents’ preferences for information sources. The final three hypotheses, 10 through 12, answer the final research question, about whether the financial status of the county or district in which the respondent works, affects the respondents’ perceptions of his or her information needs, use of electronic information sources, or use of library-based resources. The rationale behind all of the hypotheses and the criteria for testing them is described in detail in Chapter 3.

*Hypothesis 1: Respondents’ work emphasizes the dissemination of packaged information rather than developing original programs.*

This hypothesis was not supported. It was directly addressed by Question 3 on the survey, for which respondents could choose among five options forming a continuum between the amounts of time spent on prepackaged programs versus originally-developed ones. Almost half of the respondents indicated that they spend more time developing

original programs (46.3%), while only 20.1% spent more time on packaged programs. Respondents were more likely to perceive their time as being evenly split between the two types of programs (29.5%) than to say that the packaged programs were predominant in their use of time. This finding may be an offshoot of the finding that some participants were dissatisfied in their access to information resources tailored to their needs as health educators, including proven programs on the topics that they needed to address. It follows that the health educators would then need to create their own programs to address their communities' evolving needs, or to address emergent health issues.

*Hypothesis 2: Respondents addressing a variety of health challenges will perceive more frequent information-seeking needs than those focusing on specific health challenges.*

This hypothesis was supported for seven of the eight different health educator activities that might trigger a realization of an information need, that were used for this study. The test for this hypothesis used the results of Question 4 from the survey to categorize respondents according to whether the focus of their work was to address a wide variety of health challenges that exist in their communities, or whether their work tends to focus on a specific health challenge prominent in their communities. (An example of a health educator who focuses on a specific health challenge would be a cancer educator, or a tobacco cessation specialist.) For the 146 respondents who answered this question, 89 indicated they address a variety of challenges (referred to here as "Generals"), while 57 focused on a specific area (termed "Specifics" for this explanation). Using these two new categories as the independent variable, the responses to survey Question 2, about the likelihood of each health educator activity to create an information need, were calculated. For this analysis, the top two response categories for

Question 2 (“always” and “usually”) were combined, and used as the numerical measure of “perceiving frequent information needs” mentioned in the hypothesis. For seven of the eight activities in the list, a higher percentage of the Generals respondents indicated that the activity either always or usually created an information need for them, as compared to the percentages for each activity indicated by the Specifics respondents. For example, 78.2% of the Generals said that developing an original program for an audience created an information need for them, versus 63.1% of the Specifics. This finding might reflect the fact that Specifics have to master a smaller proportion of the overall body of health information, in order to keep abreast of new literature on their particular topic, while Generals have to stay up to date on myriad topics.

The one exception among the list of activities used for this measure was working with coalition partners to address community needs; the Specifics indicated that this activity is slightly more likely to create an information need for them, as compared to the level for the Generals (Specifics 49.1% versus 47.7% for Generals). This difference in response is very slight, however, and may simply represent measurement error. It is not sufficient to take away from the fact that this hypothesis was primarily supported by the results.

*Hypothesis 3: Respondents developing new programs will perceive more frequent information-seeking needs than those delivering packaged programs.*

This hypothesis was not supported by the findings, in that some activities were more likely to prompt an information need for those who deliver primarily packaged programs, while an equal number of other activities were more likely to spur a need for

those emphasizing original programs. For this test, the results of survey Question 3 were used to break the respondents into the two groups determined by whether they were emphasizing packaged or original programming. The dependent variables again were the number of responses in the top two categories for the Question 2 measure of how likely each health educator activity was to create an information need, as described for Hypothesis 2 above. The result of this hypothesis test would indicate that factors other than just the type of programming source have a greater influence on how likely an activity is to be perceived by respondents as creating an information need for them.

*Hypothesis 4: Respondents with advanced credentials will be more likely to rate themselves as having a higher information-seeking ability than those without credentials.*

This hypothesis was supported, for both items used to represent the concept of “advanced credentials”. To define a respondent as having an advanced credential, The survey question D3 about educational experience was the source of establishing which respondents had one or more of the advanced credentials: the Masters of Public Health (MPH) degree, or the CHES certification. The measure of self-reported information seeking ability was derived from Question 5, and used the top scale item only, which is respondents who rated themselves as having “excellent” information-seeking ability. Support for this hypothesis was very clear from the descriptive data: Fifty-five percent of respondents with an MPH degree rated themselves as having excellent ability to find information, as compared to 25.4% of respondents without an MPH degree. Using the CHES certification as a criteria, 42.1% of respondents with this credential rated

themselves “excellent”, while only 27.6% of non-CHES health educators rated themselves in this highest category for information-seeking ability.

In light of the finding that health educators have a wide range of academic experience and backgrounds, the interpretation of the meaning of this hypothesis test result is not clear. The obvious conclusion might be that the MPH degree, or preparation for CHES certification, entail sufficient focus on information seeking techniques to create a sense of confidence in respondents who possess one of these credentials. However, this study has shown that health educators may hold bachelors and graduate degrees from many other disciplines, some of which may also address information-seeking directly as well. In addition, this study did not measure respondents’ actual information-seeking abilities in any way; it focused on their self-perceptions of their abilities to find information.

*Hypothesis 5: Respondents receiving formal training in using electronic information sources will be more likely to perceive themselves as having a good to high level of information literacy.*

This hypothesis was supported by the study. Survey Question 7a separated the participants according to whether or not they had had formal training in using electronic information sources to meet their professional information needs. Fifty-nine percent of respondents stated that they had experienced this kind of formal training. Using this question to divide the total respondents into two groups (Training and No Training), the responses to survey Question 6 for each group were calculated. Question 6 gave participants a five-point scale for rating their ability to evaluate the quality of information they find, and provided an explanation and some criteria for the basis of that evaluation.

The concept of the ability to evaluate information quality is used as a representation of the concept of information literacy used in the hypothesis. To test the hypothesis, the responses of the training and non-training groups were calculated, using the first two positions on the scale for Question 6: excellent and very good.

For the respondents who had received training in information seeking, 86.3% rated themselves as excellent or very good at evaluating information quality, as compared to 77.9% of those who had not had training. Although this tends to support the hypothesis, it is also notable that both groups tend to rate themselves highly regarding information evaluation.

*Hypothesis 6: Respondents reporting a more frequent need to engage in information seeking will express a higher level of ability to access information sources than those reporting infrequent information needs.*

This hypothesis was supported, however, it largely reflects the somewhat lopsided results that occurred for both of the measures used to test this hypothesis, leaving no room for another outcome. This hypothesis was tested by using the results from the particular item on survey Question 1 which asked respondents how often they needed to look for information for any of the other health educator activities listed in that question, as a basis for establishing whether participants were more frequent information seekers.

The results for this Question 1 item was then cross-tabulated with the results of survey Question 5, which assessed participant's perceptions of their information-seeking ability. It is notable that few respondents indicated that they had infrequent needs for

information, and few respondents reported that their ability to find information was below the level of the top two scale items for information seeking ability.

Thus, among respondents who indicated that they frequently engage in information seeking for their work, 34.2% rated themselves as having “excellent” information seeking skills, while another 54.7% rated themselves as being “very good” at finding information. The main message of this result is less that the hypothesis is supported, than it is to underscore that these health educators actively look for information as part of their workflow, and their frequent participation in information seeking probably helps to reinforce their general feelings of competence about their abilities to find information.

*Hypothesis 7: More frequent information-seekers will be more likely to use a narrow range of trusted sources than to explore a wide variety of sources.*

This hypothesis was not supported by the results. The test for this hypothesis involved using the same item from survey Question 1 to identify which respondents termed themselves frequent seekers of information, then examining their responses to two statements on survey Question 13. This question presents respondents with multiple statements, then asks for their reaction to the statements using an agree-disagree type of Likert scale. The statement used to exemplify the concept of exploring a wide variety of sources was “When I first hear about a new health issue, I like to do a general search on the Internet (e.g., “Google it”) to learn more about the topic. Among frequent information seekers (which represents most of the total respondents), 47.5% agreed strongly with this statement, while another 45.8% indicated agreement, leaving few respondents to take issue with the statement.

The responses of frequent information seekers to another statement from Question 13 were used to represent the concept of limiting one's search to a "narrow range of trusted sources." This statement was "When I research a health topic online, I usually restrict my search to specific websites I am very familiar with." In contrast with the reaction to the first statement, only 16.2% of frequent information seekers said that they strongly agree with this statement. Even if the frequent seekers who agreed with this "narrow source" statement are added in, the result would still be that only 65.8% of frequent information seekers agree that they use a more restricted search, which is far less than the 93.3% who stated that they use a wide search, which indicates that the hypothesis is not supported by these findings. Note that respondents were not prevented from agreeing with both statements, which accounts for the cumulative percentage that would exceed 100%.

*Hypothesis 8: Respondents would be more likely to use an interpersonal source initially than a mediated one, to address their information needs.*

This hypothesis was not supported by the results of the study. This hypothesis was tested using the results of survey Question 11, which asked respondents to indicate which of a list of potential sources for information they would choose to use first, to address an information need related to their work. The respondents overwhelmingly selected online electronic sources as their first choice for meeting their information needs: 51.7% elected to search the websites of health-related organizations like the Centers for Disease Control and Prevention, or the American Cancer Society. The next most-selected first-choice source was searching for information available on the Internet (32.2%). In contrast, the



two interpersonal sources on the list were highly unlikely to be a first choice source; asking a question of a healthcare professional was the first choice of only 5.4% of respondents, while no respondents would turn first to a medical librarian for their answers.

This response was quite different from what was expected based on the pilot study and formative research, but this may reflect the fact that those participants were health educators working in settings with easy access to physicians, nurses, and other health professionals. The response to this hypothesis is quite consistent with the image of the Appalachian health educators who have high-speed online Internet access, but not necessarily the ability to quickly pose questions to a range of health professionals. The neglect of the medical librarian as an preferred and interpersonal source was also consistent with the study findings that these health educators generally have inadequate access to library resources, including the librarians themselves.

*Hypothesis 9a: Respondents' use frequency for print or electronic library resources will be lower than for online Web-based ones.*

This hypothesis was supported by the study's findings. The responses to survey Question 9 were used to test the hypothesis. Question 9 provides a list of potential information sources, and asks respondents to indicate how frequently they use each source type to inform their work. The claim of support for this hypothesis is readily derived from the fact that 83.2% of all respondents indicated that they "frequently" use information available on the Web as an information source, while 71.4% use the websites of esteemed health-related organizations such as the CDC. These results establish a far higher level of frequent use for these Web-based sources, versus the results for the use of

library sources from the same question, which are 24.8% for print resources from a medical/health library, and only 8.7% for a library's electronic databases of health information, such as journal articles.

This hypothesis does not say anything about differing levels of access to library sources versus Web-based information sources, which is likely to be a factor in the frequency of use of the library sources, nor does it address the respondents' awareness of available library resources. It is important to remember that awareness of and access to library resources can vary substantially among health educators.

*Hypothesis 9b: Respondents' use frequency of library-based resources will be lower than that of non-library interpersonal sources.*

This hypothesis received mixed support from the findings. It was tested using the same survey Question 9 as with Hypothesis 9a, and focusing on the respondents who frequently used each of the items on the list of sources. The non-library based interpersonal source was represented by the item from this question "Asking a doctor, nurse, or other healthcare professional", which was frequently used by 20.8% of respondents. This is slightly lower than the frequent-use level for the printed resources from a medical library (24.8%), which works against the hypothesis. However, the frequent-use level for a library's electronic databases (8.7%) or getting assistance from a medical/health librarian (0.7%) is much lower than the level for asking a health professional, which lends support for the hypothesis.

### *Hypotheses About County Economic or Health Status*

The last three hypotheses all address the potential effects of the economic status of the county or region in which the health educator works, on certain aspects of the health educator's information behavior. For these three hypotheses, frequency data for the specified measures used to represent the concepts within the hypotheses were cross-tabulated and used for a Chi Square analysis of the observed and expected frequencies, in order to establish the statistical significance of the differences in the frequency data for the ARC financial status categories for each county. For the analysis for these hypotheses, the financial status categories were collapsed into two categories. As described in Chapter 3, the top two of the five ARC financial categories had already been combined into one, because of the extremely small number of Appalachian counties at the Attainment (highest) level. For the Chi Square analyses, the top categories (Attainment/Competitive, and Transitional) have been collapsed into one new category called Top Two. The lowest two categories (At Risk and Distressed) have been combined into one new category called Bottom Two. These two new categories then serve as the independent variables for the Chi Square analysis. In order to insure that all cells are sufficiently large to support the Chi Square analysis, the dependent variables about the various aspects of the respondents' information behavior were also collapsed as needed. The Chi Square analysis parameters were set to yield the exact p value, in order to apply the most stringent standard for establishing the statistical significance of the findings.

The Chi Square analysis was also run for each of these hypotheses using the Robert Wood Johnson Foundation County Health Rankings Health Status data as the independent variable, instead of the ARC financial status. The top two quartiles were collapsed into one category called Top2Health, and the two lowest quartiles were also collapsed into a single category called Bot2Health.

*Hypothesis 10: Respondents in advantaged areas will report a higher level of use of electronic information sources than those in challenged areas.*

This hypothesis was partially supported by the analysis, for one kind of electronic source. To test this hypothesis, the dependent variables related to the respondents' information behavior were the three electronic sources included as items within the survey Question 9, about the frequency of use of a range of information sources. The three items that represented the "electronic information sources" concept were searching the websites of health-related organizations, searching for information available on the Internet, and using the library's electronic databases. For this analysis, the Question 9 response levels for each item were collapsed down into two categories: Frequently and Less Frequently. The latter combined often, occasionally, rarely, and never, while "no access" was recoded as a missing response.

The Chi Square analysis showed that there is not a statistically significant difference in the frequency of use of health organization websites by health educators working in counties with higher financial status, versus the same statistic for those working in counties with lower financial status. The difference in their use of library electronic databases was also not statistically significant. Therefore, for these two types of electronic sources, the hypothesis was not supported.

However, for the third electronic information source, searching for information available on the Internet, the Chi Square analysis did reveal a statistically significant difference, based on the financial status of the health educator's county. Health educators working in the financial advantaged counties (those categorized as having Attainment, Competitive, or Transitional status) exhibited more frequent use of information from the Internet (63.7%), than did health educators working in financially challenged counties (36.3%, for those categorized by the ARC as being At Risk or Distressed). This difference in their frequency of using Internet information is statistically significant at the level of  $p < .01$ , in the direction specified by the hypothesis. Given that the study has shown that virtually all of the health educators in the study have high speed Internet access, it appears that respondents working in financially disadvantaged counties are not using it as frequently as an information source. It may be that financially disadvantaged counties are more likely to have Internet use policies that restrict their health educators' use of the medium as an information source.

The Chi Square analysis using the Health Status categories as the independent variable, instead of the financial status categories, was also run for the three electronic information sources included in the list for survey Question 9. None of the use frequency differences by county health status was statistically significant.

*Hypothesis 11: Respondents working in advantaged areas will more frequently perceive a need to engage in information seeking than those in challenged areas.*

This hypothesis was not supported by the Chi Square analysis results. To test this hypothesis, the dependent variables were all of the items used in survey Question 2, which are health educator activities that potentially can create an information need for the

health educator. This question used a frequency scale to categorize the responses. For the Chi Square analysis, the rarely and never categories were collapsed together, to insure that all cells were of sufficient size to allow for the analysis. For the eight activity items listed for Question 2, only one of them displayed a statistically significant difference in the frequency for which it inspired an information need based on county financial status, although it was in the opposite direction from the one specified in the hypothesis. For the activity “fielding questions from people attending your presentations,” health educators in financially challenged counties were actually more likely than those in advantaged areas to (usually) perceive an information need arising from that particular activity. This result was statistically significant at the level of  $p < .01$ .

No other activities reflected a statistically significant difference in the frequency of perceived information needs based on the financial status of a health educators’ county. The analysis by county health status also did not produce any meaningful findings.

*Hypothesis 12: Respondents in advantaged areas will use library-based resources more frequently than those in challenged areas.*

This hypothesis was partially supported by the survey results. To test this hypothesis, the measure of the use of library resources comes from the survey Question 12 items. The frequency scale for the original Question 12 was collapsed into three categories of use of and access to library resources, to ensure that all cells were of sufficient size to support the Chi Square analysis. The first new category, “have access and use,” was comprised of the original categories of “frequently”, “often”, “occasionally”, and “rarely”. The new middle category is “have access and don’t use,”

which is the original “Never” category. The final category is “no access”, which is the same as the original category with the same name. The Chi Square analysis was run for all nine items on the Question 12 list, two of which displayed statistically significant differences in frequency of use of library resources, based on the financial status of the county.

The first item which generated a meaningful difference arising from county financial status was “accessing electronic information resources of a health or medical library.” This library resource was used at least rarely (or more often) by 52.9% of health educators in the advantaged counties, versus only 31.7% of health educators in challenged counties. This difference was significant at the level of  $p < .03\%$ , and represented a difference of two and a half standard deviations. The direction of this result clearly supports the hypothesis.

The second item which demonstrated a statistically significant difference by economic status was “visiting a public library that has health or medical resources available.” However, the difference in the use of this library resource by health educators, based on county financial status, actually indicates that health educators in advantaged counties are less likely to use this kind of library resource than the ones in disadvantaged counties were. Over 60% of respondents in advantaged areas indicated that they had access to a public library with medical resources but chose not to use it, versus only 40% in challenged areas. This difference was significant at the level of  $p < .03\%$ . Although this particular finding cannot be directly applied to the hypothesis, because saying that the

advantaged-area health educators use the resource less is not the same as showing that the challenged-area respondents use it more, it is clearly not aligned with the hypothesis.

No other library resources formed the basis for a statistically significant difference in the frequency of their use by health educators working in an advantaged or challenged area.

Once again, the county health status distinction also did not yield any significant findings related to this hypothesis. The dearth of definitive responses coming out of the Chi Square analysis indicate that there are more, and more complex, factors influencing the various manifestations of health educator information behavior than simply county financial or health status alone.



## Chapter 5

### Discussion and Recommendations

This chapter summarizes the key findings from the study and discusses their implications. A brief review is presented of some of the existing online sources that may help to address the information needs of public health educators. The next section of Chapter 5 suggests a vision of a more information-centric role for Appalachian health educators within the matrix of public health professionals who work in local health departments. The chapter concludes with suggestions for further research, and a section on the limitations of the study.

#### *Key Findings*

##### *The Role of Information*

The results for several measures support the conclusion that information is a significant component of the professional activities of health educators. Given a fairly comprehensive list of typical activities health educators engage in, almost 80% of all respondents indicate that they frequently needed to look for health information to support their professional endeavors, achieving a higher frequency rating than any of the other activities. On another measure, responses reveal that many activities are likely to prompt a need to look for information, such as developing an original education program, assessing the community's needs, working with coalition partners, and program evaluation. The open-ended responses generally reinforce the conclusion that most of this study's participants perceive that they frequently need information for their work, and

that they would like to have better access to information, and more efficient and effective ways to evaluate the quality of the information they encounter.

### *Perceived Information Literacy*

This study's participants generally perceive themselves as competent and effective at finding and evaluating information. However, these measures did reveal that the majority of them also perceive that there is room for improvement, as they were most likely to characterize themselves as "very good" rather than "excellent" at information seeking and evaluating information. In a similar vein, although about 60% of participants had experienced formal training in using electronic information sources, the majority of these indicated that they were "somewhat satisfied" with the effectiveness of that training. Eight out of ten expressed an interest in learning more about information technology that would facilitate their work. The pattern of responses seems to indicate that while many health educators are doing the best they can with what they currently have, and manage to find an adequate amount of information, many also recognize that there is much to be gained from easier access to pre-identified, better quality information sources. They would welcome training and technology that improve their ability to access the information that fuels their professional activities.

### *The Internet as an Information Conduit*

The Internet and World Wide Web serve as the default source of information for these health educators. When they perceive a need to look for information, the overwhelming favorite alternative is to search the websites of trusted health organizations like the Centers for Disease Control and Prevention, followed closely by conducting

general searches of the Web for topics of interest. Not only are these web-based sources the most frequently used ones, but they also are perceived to be the most satisfying to use. One very encouraging finding from this study is that almost 100% of respondents have high-speed Internet access. This means that this aspect of the information technology infrastructure is not a barrier to improving their access to information, a condition which opens up a wider range of potential solutions to address this issue, such as web-based training (both live and on demand), information portals, or electronic journal repositories.

#### *The Need for Data*

One of the most interesting findings that emerged spontaneously from the open-ended responses is that many of these health educators have a need for data as well as information. Accurate and timely data are needed for community health status assessment, which then plays into the kinds of programs and support services health educators design and implement, to deal with health challenges. Access to data is also important for writing grant proposals, an important source of funding and other resources. Some of the barriers preventing the respondents from obtaining the data they need may be: 1) a lack of access to local (especially county-level) data, because other agencies either don't keep adequate records or have policies in place to block sharing their data, 2) a lack of awareness of data sources available online, or 3) governmental (most likely state-level) policies restricting Internet use that effectively block the health educators from accessing social media, or obtaining information on legitimate medical topics that, in another context, involve terms might be used to search for online pornography.

Multiple respondents complained about their state government's restrictions on the use of common Internet plug-in applications that enhance webpage functionality, the absence of which effectively blocked fully-functional access to the Robert Wood Johnson Foundation's County Health Rankings data. This is the type of resource that is available for free and ideally suited to the data needs of public health workers in general, including health educators, but for some, it remains elusively out of reach behind a wall of misguided technology use policy.

#### *Libraries are Not a Significant Source of Information*

For most of these health educators, libraries or library-based resources are not perceived to be a significant source of information for their work. Furthermore, obtaining reference assistance from a librarian is the least likely to be used of all of the library resources assessed in this instrument. These findings are consistent with large scale studies of library use and perception, conducted with a wide range of potential user populations, such as the OCLC study (DeRosa, Cantrell, & Cellentani, et al, 2005). For Appalachian health educators in general, library use seems to be limited to "rare" access of electronic library resources, by those few health educators who have access to a medical, academic, or larger public library. Taking both the quantitative measures and the open-ended responses into consideration, there appears to be three explanations for this perception: 1) some health educators do not have access to a library with the kinds of resources they need, or that access is too difficult or inconvenient, 2) some health educators are not aware of the range of resources or services that might be available to them from a library that they can access, or they don't perceive the library as a better

source than the Web, or 3) other health educators recall the access to journal literature and other high-quality resources that they enjoyed while they were in college, and wish they could obtain that access again.

### *Multidisciplinarity*

It is well established that public health is a highly interdisciplinary field, as it has a problem-oriented approach to an overarching goal of improving quality of life and decreasing preventable death or disease, which calls for the participation of professionals from a wide variety of disciplinary backgrounds. This study reveals that, for Appalachian health educators, there is an additional factor of multidisciplinarity at play, because participants' academic backgrounds range well beyond the expected fields of health education/promotion, nursing, or education. These health educators include individuals with degrees in many other fields as well. This finding has significant implications for any plans to meet their information needs, and to improve their access to information sources, because it implies that there may be little standardization in the specific scholarly information resources that they were accustomed to using while seeking their degrees, as well as in the kinds of training in the use of information technology that they may have received as part of their degree programs. Although one measure showed that formal training in using information technology was more likely to have originated as part of professional development, or as a combination of professional development and academic training, there is the added complication that health educators may have information needs that cross disciplinary boundaries, and require them to become familiar with particular journals and other sources that they did not use as part of their academic

training. Informing an interdisciplinary practice is bound to present additional challenges for information professionals or the designers of information portals, and that would seem to be the situation for health educators in Appalachia as well.

In light of the fact that many respondents expressed a desire to have convenient access to pre-vetted information sources that they would not have to spend time evaluating for quality, library resources and services would seem to be a good answer for this need. One issue is that the individual circumstances of the health educators participating in the study vary widely, in terms of their potential access to a medical or academic library that would have the kinds of resources and subject-area specialist librarians the respondents would benefit from using.

### *Discussion and Recommendations*

This section extends the discussion of the information behavior of Appalachian public health educators beyond the scope of the data from this descriptive study, in order to situate these findings within three larger contexts. The first is the challenge of informing this aspect of the practice of public health within an increasingly complex information environment, amid a community environment besieged by myriad health challenges. The second is extending the reach of library electronic resources (both scholarly and practice-oriented) to serve this specially-defined user community. The third is to suggest a new metaphor for the evolving role of health educators as providers of important health information to their communities, one that overtly prioritizes the

informational dimension of their work, and establishes the need for increased collaboration between the fields of public health and information science.

This study has sought to illuminate the information environment, and the special information challenges faced by public health educators working in Appalachian counties, from their perspective. There is a feeling that resonates from the data gathered for this study that many of these respondents are passionate about their work, and are attuned to facing challenges of all kinds in delivering services to the communities of which they are a part. The sense of frustration that also comes through from many of the respondents is understandable; they recognize the kinds of information or data they need to complete their important mission, but are thwarted by misguided policies, or economic barriers to accessing that information.

As with other biomedical fields, public health and health educators are enveloped by the current paradigm of evidence-based practice (Brownson, Baker, Leet, Gillespie, & True, 2010), meaning that all of their efforts and programs need to be grounded in proven methods, informed by high quality information and knowledge, and must be able to yield measurable, positive effects for their communities. An evidence-based approach creates needs for both information and data to inform practice, and this study establishes that these needs extend to health educators as well.

Public health, which represents the most underfunded aspect of US health expenditures, is facing increasing economic pressure to accomplish more and better results, while being given even fewer resources with which to accomplish their mission. Several of the public health directors contacted in this study sent back sad replies to the

researcher's inquiries about the number of health educators on their staff, indicating that they no longer could employ health educators because of budget cuts, or that hiring freezes were in effect regarding the replacement of retiring or job-changing personnel. It is an unfortunate reality that health educator positions may sometimes be seen as more expendable than some other workers, such as environmental safety technicians, restaurant inspectors, or nurses, in local health departments. One answer has been to ask nurses to also serve as health promotion specialists, or to have health educators take on other duties, such as with the respondent who is also serving as the public information officer and communication specialist for her LHD.

All of these phenomena, which only increase the health educator's need for efficient and effective access to appropriate information sources, despite fewer financial resources to secure them, are set against the backdrop of an explosion in the need for health educators' health promotion and disease prevention services, because of the prevalence of a miserable array of health challenges in their communities. In Appalachia, these diverse challenges include: chronic diseases like diabetes, the "obesity epidemic" and its associated maladies like heart disease and cancer, issues of addiction to illicit and prescription drugs, the devastating effects of methamphetamine addiction and production on individuals and families, the continuing battles to reduce teen pregnancy and sexually transmitted disease, and ongoing responsibilities to monitor and preserve environmental health. To this list we can also add newer areas of concern for public health, such as bioterrorism and disaster preparedness issues.



Taking health educators/health promotion specialists out of the equation at a time when these health challenges are rampant, particularly for Appalachia, would effectively be a retreat back from public health's most fundamental strategies. The primary strategy is the prevention of health problems before they occur for each individual, through education about the consequences of poor health choices, and the benefits of taking suggested positive steps. The secondary strategy of health promotion addresses those already experiencing adverse health effects, by providing education and supportive guidance on how to improve their health status through lifestyle change. Without the health educator to serve as the prominent conduit for these messages to reach community members, public health's impact on that community arguably would be shifted back along the spectrum towards the domain of primary healthcare, which is to deal with medical issues after the fact. In Appalachian communities where access to primary health care is limited by poverty, rural distances, or cultural issues for some residents, the LHD's medical staff may already be overwhelmed by serving as the primary care source for those community members, and they cannot reasonably be expected to also take on the full responsibilities of the health educator as well. These communities need to have the services of staff whose sole responsibilities are to serve as health educators and health promotion specialists, so that the intrinsic strategies of public health get the full attention they deserve.

As vital members of the LHD teams in Appalachian counties, health educators need to be provided with the training, skills, and access to technology and information resources that are essential for them to do their work effectively and efficiently. The

largest proportion of the distribution of their efforts related to information behavior needs to be spent on applying and using the information, rather than on identifying, searching, and acquiring that information. As an initial step towards achieving this state, health educators need to be aware of and proficient with existing resources that already support this objective. The next section describes some of these existing resources.

The other half of achieving this state is to assure that the information literacy levels of health educators are elevated so that they can effectively deal with their current and future information environments. A significant number of respondents rated their ability to find and evaluate information as “excellent”. Some used the open-ended measures to express their feelings that they have access to all of the information they need for their work. Allowing for the fact that some respondents may indeed be highly skilled at finding and using information, or that their particular job may not require as much information seeking, or that their particular LHD may have access to a medical or university library, it must also be considered that their self-evaluation of their information literacy levels may not accurately reflect their actual abilities to contend with their information environments. This is not to imply that their answers to the survey were insincere, but rather reflects that information seeking research has shown that users of information systems typically overestimate their ability to effectively use that system. Users do not always have the perspective to recognize the ways in which their search strategies or techniques could be improved, or to know what relevant information they missed retrieving from the system. It is likely that many of the respondents, who feel they have no problems obtaining needed information, do not realize what they are missing, or

are engaging in “satisficing” behavior. The implication of this observation is that health educators will need to be willing to acknowledge the fact that information literacy is a goal that knows no limit, and even information professionals must make continual efforts to learn about new systems, techniques, or sources of information. This attitude is an essential part of a suggested new information-oriented role for health educators, which is described in a separate section below.

#### *Existing Solutions for Information Needs*

As an exploratory look at the way public health educators use information, the survey focused on their preferences for or satisfaction with general types of information sources, rather than asking about their awareness or use of specific sources. Therefore, it cannot be definitively concluded from these data whether respondents who complained about a lack of access to a type of resource, are actually unaware of some existing ways of accessing that kind of information source, or whether they do know about these sources but are dissatisfied with their results.

For example, in the open-ended responses, some participants complained that they do not have access to electronic scholarly journals. However, there are resources available online that permit at least partial access to scholarly health journals at no cost. Some of these resources are described below. It cannot be determined from these data whether this comment was meant to say literally that the respondent has no access at all to online scholarly medical journals, which might indicate a lack of awareness of some important resources, or whether they feel the access is insufficient in terms of providing full text articles. Future research would need to address this more specifically, to

determine both the awareness levels and the satisfaction levels with the following existing information sources.

Full text journal articles can sometimes be obtained for free from Google Scholar, and it is always worth investigating this convenient option. However, Google Scholar sometimes just directs the searcher to the publisher's website, where the article is available for a fee. Health educators in need of journal literature definitely need to be aware of the resources provided from the National Library of Medicine, as supported by the National Institutes of Health.

- **Medline:** This is a comprehensive bibliographic database of biomedical and life sciences journal literature, which is sponsored by the National Library of Medicine and the National Institutes of Health. Records in this database reflect the contents of thousands of journals and other meaningful publications in this area, and include at least the full citation for the article, and often an abstract. In addition, if the full text article is available online at no charge, the record will indicate this, and usually link to the article or the provider of the full text version. Information about Medline is available at this URL: [http://www.nlm.nih.gov/databases/databases\\_medline.html](http://www.nlm.nih.gov/databases/databases_medline.html).
- **PubMed:** The National Library of Medicine provides this interface to access the Medline database. PubMed provides a high level of searching capability, including advanced search functions, customization of searches, and email alerts when new items relevant to designated past searches are added to Medline. The PubMed interface can be accessed at [www.ncbi.nlm.nih.gov/pubmed/](http://www.ncbi.nlm.nih.gov/pubmed/).
- **PubMed Central:** This is an actual electronic archive of full text biomedical journal literature that publishers have elected to make available for free to users. It is another free resource from the National Institutes of Health, and is available at <http://www.ncbi.nlm.nih.gov/pmc/>.
- **Loansome Doc:** This is a document delivery service which uses medical libraries to deliver copies of full text journal articles from Medline that are not available for free directly from the Web. For some content, there are fees imposed by the providing library or the journal publisher. This may not be an option for many health educators, but is definitely worth exploring. Information about Loansome Doc can be found at [www.nlm.nih.gov/loansomedoc/loansome\\_home.html](http://www.nlm.nih.gov/loansomedoc/loansome_home.html); this webpage also includes a link to the login page for this service.

In their open-ended responses, some participants also mentioned that they would like to have an online portal that would provide access to information sources and other online resources relevant to health educators. Two existing portals of this kind are discussed here. The first is specifically designed for public health professionals; it is called the Partners in Information Access for the Public Health Workforce website, available at [phpartners.org/index.html](http://phpartners.org/index.html). The Phpartners portal was collectively created by several agencies of the US government, some of the professional organizations for public health (including SoPHE), and health/medical libraries. It was created out of recognition of the fact that public health professionals needed a simple way to access a wide variety of sources that have already been “vetted” by information professionals and found worthy. The portal’s main page includes a list of topical links relevant to particular kinds of public health workers, including a link for health education and promotion sources. Sources accessible through this portable address needs for information, journal articles, effective programming material, data on health conditions, grant funding opportunities, and other areas of interest.

The other portal of potential interest to health educators in Appalachia is the Rural Assistance Center (RAC), a resource developed from a partnership between the US Department of Health and Human Services (HHS) and the University of North Dakota’s Center for Rural Health. It is available at [www.raconline.org](http://www.raconline.org). In addition to many of the categories of resources offered by the Partners portal, the RAC also offers the reference services of “information specialists”, who can assist portal users by developing custom

searches for user's information needs, and assistance with using many of the resources available through the portal.

These resources are not a panacea for the gaps in information access experienced by many of these Appalachian health educators, because full text coverage of journal titles is more limited than it would probably be through an academic or medical library. Other titles of interest may be impacted by one-year embargoes on the electronic full text version of an issue, but this can be an issue for users of academic libraries as well. The specialized portals mentioned above can connect health educators to a range of valuable information and resources, but probably not all of the information and resources they would like to have. However, one of the best ways to assure that these kinds of online resources are maintained and improved over time is for them to generate usage statistics that demonstrate their usefulness. Although awareness levels cannot be determined from this research, the first step is for health educators and other public health professionals to be made aware of these resources, and supported in using them effectively, through systematic referrals by information professionals, and focused campaigns by the sponsors to groups of potential users, such as health educators.

In the event that the freely available health information sources mentioned above are not sufficient to meet all of the professional information needs of many Appalachian health educators, other solutions need to be identified and implemented. Health educators working in LHDs are employees of the state in which they work, a status which could open up possibilities of extended information access using existing information systems. For example, state universities that host a school of medicine, nursing, or the allied health

professions, with libraries that maintain electronic journal collections of scholarly literature to support those schools, could define the employees of LHDs, including health educators, as an extended user group, and allow them to have proxy access to at least the relevant portions of their electronic collections. The rationale behind this extension of their library's electronic services to include this additional state employee user group would be that the state university library receives support from tax revenue, and so the benefit the health educators receive from having access to these information resources becomes an additional value-added return on the taxpayers' initial investment. LHDs provide services to the members of their communities, so the cycle of added value returns to directly benefit the taxpayers, from the positive effects of the increased information access on the LHDs services.

Although it is a relatively simple thing to conceive of this arrangement, enacting it as a solution is more complicated. The university libraries providing access must also provide user support, in that outreach services will be needed to inform public health employees of the increased availability of these resources to them, and to establish how they can be accessed. In addition, remote reference services via telephone, chat, or email, will also need to be provided to the new users. Most importantly, the state university libraries will have to revise their content licensing agreements with the publishers and aggregators who provide the rights and physical access to the electronic journal subscriptions, to allow access to a new class of users. Electronic journal subscriptions already represent a substantial budget item for university libraries, and in the current dismal funding climate, increasing the expenditure to benefit a remote user group might

not be politically viable, despite the clear benefit for the citizens of the state. The findings of this study indicated that there are public health educators working in Appalachia who do have access to scholarly electronic medical information, so a first step would be to study these success stories, to see how this has been accomplished, and to determine how this successful process can be extended.

Considering the scope of the changes in policy and process that would be involved in developing this kind of access to the online journal collections of state university libraries for health educators and other public health workers, it is reasonable to consider if the benefit of this information access is worth the cost of its creation. Do health educators in Appalachia really need access to this information, and will they use it enough to justify the expense of providing it? The data from this study establish that many health educators do not use library resources, including electronic sources, but it also indicates that this non-use often stems from a lack of access, or a lack of awareness of a resource, issues that would need to be addressed anyway, as part of establishing a new connection between public health educators and their states' academic libraries.

One of the key findings of this study is that the work of these public health educators in Appalachia is infused with information needs, and that a substantial number of them perceive that these needs are not adequately addressed by the information and data sources currently available to them. Considering that information environments are highly dynamic, and characterized by continual changes in information technology, and in the ways that information is made available and used by people (as demonstrated by social media), it seems even more important to attempt to address the health educators'



potential information needs as completely as possible, with the expectation that “satisfactory information access” will always be a moving, and somewhat elusive, target. Leaving their information needs unmet now, would only leave them with a larger information deficit in the future. In fact, it will be imperative to address the Appalachian health educators’ information access issues, in order to support the transformative third context for the results of this study, which is presented in the next section.

### *Transforming the Role of the Health Educator*

With a situation characterized by a growing need for their services, but with fewer economic resources to pay for both them and the things they need to accomplish their work, health educators may need to redefine the contribution they make to the overall efforts of the local health department, and a mastery of the current information environment forms the heart of this proposed transformation. If public health educators can fully recognize and accept the complexities of the current information environment as an opportunity for the profession to co-opt the role of onsite information specialist at LHDs, they can be more easily recognized as indispensable conduits of information not only for their community members, but also for their array of colleagues as well. This transformation needs to be supported by a systematic expansion and formalization of information literacy training into both the academic tertiary education of health educators and their professional development curricula. This curricula should be patterned after the information literacy standards developed by SoPHE, as discussed in Chapter 1. The sustainability of this training would require an ongoing collaboration between academics

and practitioners from the field of information science and their counterparts in public health. In academic settings, this collaboration could be supported by such structures as joint academic appointments or adjunct relationships with information science faculty, cross-listing of targeted information science courses, or the expansion of information-oriented sessions at public health or health educator conferences, in which information science scholars are encouraged to submit their research as well.

It should be noted that this suggestion addresses the most conventional, linear educational path to becoming a health educator – a degree or major emphasis in public health, or health education/promotion. In light of the actual high degree of multidisciplinary in the educational backgrounds of health educators that was established in this study, these collaborative structures between academics in public health and information science would not necessarily reach students in other fields who then become public health educators. Health educators grounded in other academic disciplines would need to be reached through professional development efforts, which could be led by either information science academics or practitioners, through grant-funded programs or trainings. From the practitioner perspective, medical librarians could create trainings specifically about information sources of value to health educators that could serve as outreach efforts to public health educators in accessible counties, or package these resources as webinars, to make them available to health educators in counties without easy access to medical library resources or personnel.

Lundeen & Tenopir (1994), in addressing the unmet information needs that isolated rural healthcare workers in Hawaii faced, suggested a program modeled after the

concept of agricultural extension agents, who serve as information specialists and trainers, systematically assisting community members in improving farming practices. Librarians involved in special outreach to meet the information needs of public health educators in Appalachia, would be functioning in a similar capacity, by making themselves (and their electronic collections of health information) available, in order to improve the information environment for the health educators, for the overall benefit of the communities they serve.

The goal of these efforts by information professionals would be to systematically provide health educators with advanced skills and techniques in information seeking, evaluation, and use, as well as the awareness of and knowledge of how to use specific information resources that address their professional concerns. As a result, health educators would be empowered to function as para-professional level information specialists for their own work, and in support of their public health colleagues' work as well. These relationships would also help to establish connections between the information professionals and the health educators, to help support the health educators' ability to cope with future developments in the information environment as well.

One way to more easily envision this transformation in the focus of the health educator role is to use a metaphor to illustrate the nature of the change. The original conceptualization of a health educator was more like a kind of missionary for health promotion and disease prevention. The health educator was seen primarily as a public communicator of health doctrine created by a health authority (such as the CDC). In this mode, the information content was a more static, predetermined message package, to be

faithfully transmitted to the communities served by the health educator. The health educator was viewed as more of a teacher or presenter of the information, but was not necessarily expected to change or interact with the information content itself, outside of minor tailoring of the message to fit the particular needs of their local audiences. The health educator in this missionary metaphor is almost exclusively an information channel.

Given the dynamism of the current information environment, and the increased complexity of the types of data and information that is required, the missionary metaphor is inadequate to meet the current needs of either public health professionals or the communities they serve. The public health educator should instead be seen as a kind of locally-oriented information coach, with the skills and familiarity with relevant information sufficient to identify, locate access, evaluate, and communicate the best information, to meet the needs of both community members and their public health colleagues.

In the context of a health educator, the information coach's efforts would be directed toward the goal of helping others make sense of their information needs, match them to the best available information, and promote good choices in its use. As an information coach, health educators will be able to direct others to the information sources they need, and also synthesize information themselves from a range of appropriate sources, in order to inform their original programs, grant applications, or other activities. As both information coaches and health educators, they will also be empowered to master a wider range of existing and emerging technologies, to both inform their practice and to disseminate their important health messages to their

community groups and colleagues in the most effective ways. The model of a health educator as an information coach reflects a level of confidence and optimism in helping others to find the knowledge or answers they need, that fits well with the existing values of this helping profession. To this researcher, librarians and health educators seem to be kindred spirits, united by many overlapping professional values, such as a dedication to answering the needs of others, and lifting up communities through education and access to information. Common values seem like an excellent basis for building strong collaborative linkages for mutual benefit.

#### *Directions for Future Research*

The value of this study lies in establishing a sense of prevalence of some of the general characteristics of the ways that these respondents interact with information, in dealing with their information needs related to their professional activities. The results of this survey can serve as a formative foundation for future research using qualitative approaches, in order to obtain a more nuanced understanding of how Appalachian health educators cope with their information needs, and interact with information sources.

The next step in a qualitative direction would be to conduct in-depth interviews with a purposeful sample of these respondents, in order to answer some of the “why” questions that emerged from between the lines of the quantitative survey data. The interview data would then help to inform a participant-observation study, in which a purposeful sample of these participants could be shadowed as they engage in a variety of their professional activities, such as looking for information online, preparing and

delivering an original program, fielding questions from their communities (via telephone or at a presentation), and preparing a grant application. The results would create a more complete picture of the processes that are involved in the respondents' information interactions, and help to inform the development and improvement of existing and new information sources.

An additional area for future research would be to employ survey techniques to determine the levels of awareness of and satisfaction with some of the existing online resources mentioned above (Medline and its access tools, and the two portals), and to determine what, if any, other free or affordable online resources they are using, and what kinds of results they are getting. Google Scholar's role in their information seeking could also be investigated in this second survey study.

Another interesting area for research would be to focus on their knowledge of and ideas for the potential use of social media to diffuse their health messages to their communities. This research track could be explored using surveys initially, but it would also be an appropriate topic for a focus group with health educators, that might in turn inform a user experience study with community members, in order to evaluate the effectiveness of social media as communication channels for public health educators' messages or campaigns.

An additional kind of study that could follow from this study is to focus in on the respondents who indicated that they had a good quality of information access, or the states which seem to provide more information-related support to their local health departments, such as Ohio. This study would focus on how functioning in a more optimal

information environment impacts a health educator's work. One framework for this kind of study might be comparative case studies: one of a county with an identified optimized information environment, and the other of a county where health educators work under tight Web use restrictions and little access to information sources, but with both counties being similar in financial status, setting, and health status.

One additional area for future research is designed to move closer to fulfilling the promise of the original goal of this research: to administer the survey as a census to all qualified public health educators working in the designated Appalachian counties. To do this, the states that had low response rates for this study would be individually focused on, and the full three-stage contact design would be used to determine more definitively which counties or districts use health educators and to then obtain their completed responses to this survey. This approach would help to determine to what extent the results reported here apply to the Appalachian health educators who were missed by the original study, and present a more complete picture of the population's information behavior.

#### *Limitations of the Study*

While the results and findings of this study are useful for an initial understanding of the topic, there are several limitations in both the design and execution of the study, which must be considered in evaluating the completeness and the applicability of the findings and recommendations. Some of these limitations are intrinsic to survey research in general, while others represent shortcomings in the design or execution of this study in particular.

Regarding limitations that are common to survey research as a method, it should be remembered that the data that comprise this study's results are self-reported by the respondents, and are therefore more reflective of their perceptions of their behaviors or activities, rather than objective tallies of actual behaviors or activities. Their actual use of various resources, for example, may vary from the frequencies reported here. An additional limitation of survey research is that the areas explored in the study are structured and limited by the questions designed by the researcher. For example, the lists of activities or resources are based on the prior research and knowledge of the researcher, who is an outsider looking into the world of the health educator, and therefore may have omitted activities or resources that belonged in the survey. Open ended measures were included to allow the respondents to bring up topics or issues that are important to them, but these respondent-initiated concepts are then not evaluated with the same precision as the other items included in the survey. Open-ended data are subject to misinterpretation or bias in their interpretation by the researcher.

Regarding the issues that are specific to this study, the response rate for several of the thirteen states involved were very low, and therefore the input from their health educators, which may have been notably different from those in other states, was not able to be considered. The technique of using telephone contact with health educators who did not return the original paper survey, nor complete the survey online, proved to be less effective than initially estimated in securing those health educators' participation, because it was sometimes difficult to reach a health educator at a particular time on the phone, and because the labor-intensity of this method made the process difficult to carry



out within the time frame for survey administration. Therefore, many Appalachian counties are substantially underrepresented in the results.

In an effort to rectify the absence of the health educators' input from these underrepresented states, their participation in a secondary round of data collection will be pursued apart from this dissertation, and will be reported and analyzed in follow-up research later, in order to achieve a more complete understanding of the Appalachian health educators' responses related to the survey's areas of exploration, and to move towards the completion of the study's intended purpose as a census.

### *Conclusion*

As an initial step toward understanding the information behavior of public health educators who work in Appalachian counties' or districts' health departments, this study has made some meaningful contributions in terms of the frequency of use of a reasonably comprehensive list of resources, and the respondents' perceived satisfaction levels associated with the use of those resources. In addition, the study has produced substantial support for the notion that information plays a large role in the work lives of these public health educators, which then leads to a natural progression of exploring what aspects of that role are working well, and which ones need to be improved, in order to ensure that their activities and impacts on their communities are fully informed.

This study provides a foundation for future research in this area, that can explore in deeper and more textured ways how Appalachian public health educators interact with information, and how that interaction may be redefined in the future, in ways that both facilitate their work, and even help them expand their impact on the health of their

communities, and the effectiveness of their public health colleagues' activities as well. It is hoped that public health educators in Appalachia, with an enhanced interaction with information supported by beneficial collaboration with librarians and information scientists, will be further empowered to deal with this region's myriad health challenges.

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Appendix

## List of Appendices

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## Appendix A: NCHEC Areas of Responsibility

### RESPONSIBILITY I

#### Assess Individual and Community Needs for Health Education

##### Competency A

Access existing health-related data

Sub-competencies:

1. Identify diverse health-related databases
2. Use computerized sources of health-related information
3. Determine the compatibility of data from different data sources
4. Select valid sources of information about health needs and interests

##### Competency B

Collect health-related data

Sub-competencies:

1. Use appropriate data-gathering instruments
2. Apply survey techniques to acquire health data
3. Conduct health-related needs assessments
4. Implement appropriate measures to assess capacity for improving health status

##### Competency C

Distinguish between behaviors that foster and hinder well-being

Sub-competencies:

1. Identify diverse factors that influence health behaviors
2. Identify behaviors that tend to promote or comprise health

##### Competency D

Determine factors that influence learning

*This Competency is not addressed in the study guide, because the Sub-competencies are related to an advanced level of practice.*

##### Competency E

Identify factors that foster or hinder the process of health education

Sub-competencies:

1. Determine the extent of available health education services
2. Identify gaps and overlaps in the provision of collaborative health services

**Appendix A: NCHEC Areas of Responsibility (Continued)****Competency F**

Infer needs for health education from obtained data

Sub-competencies:

1. Analyze needs assessment data

**RESPONSIBILITY II****Plan Health Education Strategies, Interventions, and Programs****Competency A**

Involve people and organizations in program planning

Sub-competencies:

1. Identify populations for health education programs
2. Elicit input from those who will affect or be affected by the program
3. Obtain commitments from individuals who will be involved
4. Develop plans for promoting collaborative efforts among health agencies and organizations with mutual interests

**Competency B**

Incorporate data analysis and principles of community organization

Sub-competencies:

1. Use research results when planning programs
2. Apply principles of community organization when planning programs
3. Suggest approaches for integrating health education within existing health programs
4. Communicate need for the program to those who will be involved

**Competency C**

Formulate appropriate and measurable program objectives

Sub-competencies:

1. Design developmentally appropriate interventions

**Competency D**

Develop a logical scope and sequence plan for health education practice

Sub-competencies:

1. Determine the range of health information necessary for a given program of instruction
2. Select references relevant to health education issues or programs

**Appendix A: NCHEC Areas of Responsibility (Continued)****Competency E**

Design strategies, interventions, and programs consistent with specified objectives

*This Competency is not addressed in the study guide, because the Sub-competencies are related to an advanced level of practice.*

**Competency F**

Select appropriate strategies to meet objectives

Sub-competencies:

1. Analyze technologies, methods and media for their acceptability to diverse groups
2. Match health education services to proposed program activities

**Competency G**

Assess factors that affect implementation

Sub-competencies:

1. Determine the availability of information and resources needed to implement health education programs for a given audience
2. Identify barriers to the implementation of health education programs

**RESPONSIBILITY III****Implement Health Education Strategies, Interventions, and Programs****Competency A**

Initiate a plan of action

Sub-competencies:

1. Use community organization principles to facilitate change conducive to health
2. Pretest learners to determine baseline data relative to proposed program objectives
3. Deliver educational technology effectively
4. Facilitate groups

**Competency B**

Demonstrate a variety of skills in delivering strategies, interventions, and programs

Sub-competencies:

1. Use instructional technology effectively
2. Apply implementation strategies



## **Appendix A: NCHEC Areas of Responsibility (Continued)**

### **Competency C**

Use a variety of methods to implement strategies, interventions, and programs

Sub-competencies:

1. Use the Code of Ethics in professional practice
2. Apply theoretical and conceptual models from health education and related disciplines to improve program delivery
3. Demonstrate skills needed to develop capacity for improving health status
4. Incorporate demographically and culturally sensitive techniques when promoting programs
5. Implement intervention strategies to facilitate health-related change

### **Competency D**

Conduct training programs

*This Competency is not addressed in the study guide, because the Sub-competencies are related to an advanced level of practice.*

## **RESPONSIBILITY IV**

### **Conduct Evaluation and Research Related to Health Education**

#### **Competency A**

Develop plans for evaluation and research

Sub-competencies:

1. Synthesize information presented in the literature
2. Evaluate research designs, methods and findings presented in the literature

#### **Competency B**

Review research and evaluation procedures

Sub-competencies:

1. Evaluate data-gathering instruments and processes
2. Develop methods to evaluate factors that influence shifts in health status

#### **Competency C**

Design data collection instruments

Sub-competencies:

1. Develop valid and reliable evaluation instruments
2. Develop appropriate data-gathering instruments

## **Appendix A: NCHEC Areas of Responsibility (Continued)**

### **Competency D**

Carry out evaluation and research plans

Sub-competencies:

1. Use appropriate research methods and designs in health education practice
2. Use data collection methods appropriate for measuring stated objectives
3. Implement appropriate qualitative and quantitative evaluation techniques
4. Implement methods to evaluate factors that influence shifts in health status

### **Competency E**

Interpret results from evaluation and research

Sub-competencies:

1. Analyze evaluation data
2. Analyze research data
3. Compare evaluation results to other findings
4. Report effectiveness of programs in achieving proposed objectives

### **Competency F**

Infer implications from findings for future health-related activities

*This Competency is not addressed in the study guide, because the Sub-competencies are related to an advanced level of practice.*

## **RESPONSIBILITY V**

### **Administer Health Education Strategies, Interventions, and Programs**

#### **Competency A**

Exercise organizational leadership

Sub-competencies:

1. Conduct strategic planning
2. Analyze the organization's culture in relationship to program goals
3. Promote cooperation and feedback among personnel related to the program

#### **Competency B**

Secure fiscal resources

*This Competency is not addressed in the study guide, because the Sub-competencies are related to an advanced level of practice.*

#### **Competency C**

Manage human resources

Sub-competencies:

## **Appendix A: NCHEC Areas of Responsibility (Continued)**

1. Develop volunteer opportunities

### **Competency D**

Obtain acceptance and support for programs

*This Competency is not addressed in the study guide, because the Sub-competencies are related to an advanced level of practice.*

## **RESPONSIBILITY VI**

### **Serve as a Health Education Resource Person**

#### **Competency A**

Use health-related information resources

Sub-competencies:

1. Match information needs with the appropriate retrieval systems
2. Select a data system commensurate with program needs
3. Determine the relevance of various computerized health information resources
4. Access health information resources
5. Employ electronic technology for retrieving references

#### **Competency B**

Respond to requests for health information

Sub-competencies:

1. Identify information sources needed to satisfy a request
2. Refer requesters to valid sources of health information

#### **Competency C**

Select resource materials for dissemination

Sub-competencies:

1. Evaluate applicability of resource materials for given audience
2. Apply various processes to acquire resource materials
3. Assemble educational material of value to the health of individuals and community groups

## **Appendix A: NCHEC Areas of Responsibility (Continued)**

### **Competency D**

Establish Consultative Relationships

Sub-competencies:

1. Analyze parameters of effective consultative relationships
2. Analyze the role of the health educator as a liaison between program staff and outside groups and organizations
3. Act as a liaison among consumer groups, individuals and health care providers
4. Apply networking skills to develop and maintain consultative relationships
5. Facilitate collaborative training efforts among health agencies and organizations

## **RESPONSIBILITY VII**

### **Communicate and Advocate for Health and Health Education**

#### **Competency A**

Analyze and respond to current and future needs in health education

Sub-competencies:

## **Appendix A: NCHEC Areas of Responsibility (Continued)**

1. Analyze factors (e.g., social, cultural, demographic, political) that influence decision-makers

#### **Competency B**

Apply a variety of communication methods and techniques

Sub-competencies:

1. Assess the appropriateness of language in health education messages
2. Compare different methods of distributing educational materials
3. Respond to public input regarding health education information
4. Use culturally sensitive communication methods and techniques
5. Use appropriate techniques for communicating health education information
6. Use oral, electronic and written techniques for communicating health education information
7. Demonstrate proficiency in communicating health information and health education needs

**Appendix A: NCHEC Areas of Responsibility (Continued)****Competency C**

Promote the health education profession individually and collectively

Sub-competencies:

1. Develop a personal plan for professional development

**Competency D**

Influence health policy to promote health

Sub-competencies:

1. Identify the significance and implications of health care providers' messages to consumers

Source: <http://nchec.org/credentialing/responsibilities/>

**Appendix B: Appalachian Regional Commission:  
Appalachian Counties & Economic Status By State – Alabama**

|         |            |              |
|---------|------------|--------------|
| Alabama | Bibb       | At-Risk      |
| Alabama | Blount     | Transitional |
| Alabama | Calhoun    | Transitional |
| Alabama | Chambers   | Transitional |
| Alabama | Cherokee   | Transitional |
| Alabama | Chilton    | Transitional |
| Alabama | Clay       | Transitional |
| Alabama | Cleburne   | Transitional |
| Alabama | Colbert    | Transitional |
| Alabama | Coosa      | Transitional |
| Alabama | Cullman    | Transitional |
| Alabama | DeKalb     | Transitional |
| Alabama | Elmore     | Competitive  |
| Alabama | Etowah     | Transitional |
| Alabama | Fayette    | Transitional |
| Alabama | Franklin   | Transitional |
| Alabama | Hale       | Distressed   |
| Alabama | Jackson    | Transitional |
| Alabama | Jefferson  | Competitive  |
| Alabama | Lamar      | Transitional |
| Alabama | Lauderdale | Transitional |
| Alabama | Lawrence   | Transitional |
| Alabama | Limestone  | Transitional |
| Alabama | Macon      | Distressed   |
| Alabama | Madison    | Attainment   |
| Alabama | Marion     | Transitional |
| Alabama | Marshall   | Transitional |
| Alabama | Morgan     | Competitive  |
| Alabama | Pickens    | At-Risk      |
| Alabama | Randolph   | Transitional |
| Alabama | St. Clair  | Transitional |
| Alabama | Shelby     | Attainment   |
| Alabama | Talladega  | Transitional |
| Alabama | Tallapoosa | Transitional |
| Alabama | Tuscaloosa | Transitional |
| Alabama | Walker     | Transitional |
| Alabama | Winston    | Transitional |

**Appendix B: Appalachian Regional Commission:  
Appalachian Counties & Economic Status By State – Georgia**

|         |           |              |  |           |              |
|---------|-----------|--------------|--|-----------|--------------|
| Georgia | Banks     | Transitional | Georgia                                  | Whitfield | Transitional |
| Georgia | Barrow    | Transitional |  |           |              |
| Georgia | Bartow    | Transitional |  |           |              |
| Georgia | Carroll   | Transitional |  |           |              |
| Georgia | Catoosa   | Transitional |  |           |              |
| Georgia | Chattooga | At-Risk      |  |           |              |
| Georgia | Cherokee  | Attainment   |  |           |              |
| Georgia | Cherokee  | Attainment   |  |           |              |
| Georgia | Dade      | Transitional |  |           |              |
| Georgia | Dawson    | Competitive  | North Health District 2                  |           |              |
| Georgia | Douglas   | Transitional | Northeast Health District                |           |              |
| Georgia | Elbert    | At-Risk      | Northwest Georgia Public Health District |           |              |
| Georgia | Fannin    | Transitional | North Georgia Health District            |           |              |
| Georgia | Floyd     | Transitional | East Metro Health District               |           |              |
| Georgia | Forsyth   | Attainment   | LaGrange Public Health District          |           |              |
| Georgia | Franklin  | Transitional |  |           |              |
| Georgia | Gilmer    | Transitional |  |           |              |
| Georgia | Gordon    | Transitional |  |           |              |
| Georgia | Gwinnett  | Attainment   |  |           |              |
| Georgia | Habersham | Transitional |  |           |              |
| Georgia | Hall      | Transitional |  |           |              |
| Georgia | Haralson  | Transitional |  |           |              |
| Georgia | Hart      | At-Risk      |  |           |              |
| Georgia | Heard     | Transitional |  |           |              |
| Georgia | Jackson   | Transitional |  |           |              |
| Georgia | Lumpkin   | Transitional |  |           |              |
| Georgia | Madison   | Transitional |  |           |              |
| Georgia | Murray    | Transitional |  |           |              |
| Georgia | Paulding  | Competitive  |  |           |              |
| Georgia | Pickens   | Competitive  |  |           |              |
| Georgia | Polk      | Transitional |  |           |              |
| Georgia | Rabun     | Transitional |  |           |              |
| Georgia | Stephens  | Transitional |  |           |              |
| Georgia | Towns     | Transitional |  |           |              |
| Georgia | Union     | Transitional |  |           |              |
| Georgia | Walker    | Transitional |  |           |              |
| Georgia | White     | Transitional |  |           |              |

**Appendix B: Appalachian Regional Commission:  
Appalachian Counties & Economic Status By State – Kentucky**

|          |            |              |
|----------|------------|--------------|
| Kentucky | Adair      | Distressed   |
| Kentucky | Bath       | Distressed   |
| Kentucky | Bell       | Distressed   |
| Kentucky | Boyd       | Transitional |
| Kentucky | Breathitt  | Distressed   |
| Kentucky | Carter     | Distressed   |
| Kentucky | Casey      | Distressed   |
| Kentucky | Clark      | Transitional |
| Kentucky | Clay       | Distressed   |
| Kentucky | Clinton    | Distressed   |
| Kentucky | Cumberland | Distressed   |
| Kentucky | Edmonson   | At-Risk      |
| Kentucky | Elliott    | Distressed   |
| Kentucky | Estill     | Distressed   |
| Kentucky | Fleming    | At-Risk      |
| Kentucky | Floyd      | Distressed   |
| Kentucky | Garrard    | Transitional |
| Kentucky | Green      | At-Risk      |
| Kentucky | Greenup    | Transitional |
| Kentucky | Harlan     | Distressed   |
| Kentucky | Hart       | Distressed   |
| Kentucky | Jackson    | Distressed   |
| Kentucky | Johnson    | Distressed   |
| Kentucky | Knott      | Distressed   |
| Kentucky | Knox       | Distressed   |
| Kentucky | Laurel     | At-Risk      |
| Kentucky | Lawrence   | Distressed   |
| Kentucky | Lee        | Distressed   |
| Kentucky | Leslie     | Distressed   |
| Kentucky | Letcher    | Distressed   |
| Kentucky | Lewis      | Distressed   |
| Kentucky | Lincoln    | Distressed   |
| Kentucky | McCreary   | Distressed   |



|          |            |              |  |
|----------|------------|--------------|--|
| Kentucky | Madison    | Transitional |  |
| Kentucky | Magoffin   | Distressed   |  |
| Kentucky | Martin     | Distressed   |  |
| Kentucky | Menifee    | Distressed   |  |
| Kentucky | Metcalfe   | Distressed   |  |
| Kentucky | Monroe     | Distressed   |  |
| Kentucky | Montgomery | Transitional |  |
| Kentucky | Morgan     | Distressed   |  |
| Kentucky | Nicholas   | At-Risk      |  |
| Kentucky | Owsley     | Distressed   |  |
| Kentucky | Perry      | Distressed   |  |
| Kentucky | Pike       | At-Risk      |  |
| Kentucky | Powell     | Distressed   |  |
| Kentucky | Pulaski    | At-Risk      |  |
| Kentucky | Robertson  | Distressed   |  |
| Kentucky | Rockcastle | Distressed   |  |
| Kentucky | Rowan      | At-Risk      |  |
| Kentucky | Russell    | Distressed   |  |
| Kentucky | Wayne      | Distressed   |  |
| Kentucky | Whitley    | Distressed   |  |
| Kentucky | Wolfe      | Distressed   |  |
| Kentucky | DISTRICT   |              | Cumberland Valley District Health Dept |
| Kentucky | DISTRICT   |              | Gateway District Health Dept           |
| Kentucky | DISTRICT   |              | Kentucky River District Health Dept    |
| Kentucky | DISTRICT   |              | Lake Cumberland District Health Dept   |
| Kentucky | DISTRICT   |              | Little Sandy District Health Dept      |
| Kentucky | DISTRICT   |              | Wedco District Health Dept             |
| Kentucky | DISTRICT   |              | Barren River District Health Dept      |
| Kentucky | DISTRICT   |              | Buffalo Trace District Health Dept     |

**Appendix B: Appalachian Regional Commission:  
Appalachian Counties & Economic Status By State – Maryland & Mississippi**

|             |            |              |                            |
|-------------|------------|--------------|----------------------------|
| Maryland    | Allegany   | Transitional |                            |
| Maryland    | Garrett    | Transitional |                            |
| Maryland    | Washington | Competitive  |                            |
| Mississippi | Alcorn     | At-Risk      |                            |
| Mississippi | Benton     | Distressed   |                            |
| Mississippi | Calhoun    | At-Risk      |                            |
| Mississippi | Chickasaw  | Distressed   |                            |
| Mississippi | Choctaw    | Distressed   |                            |
| Mississippi | Clay       | Distressed   |                            |
| Mississippi | Itawamba   | Transitional |                            |
| Mississippi | Kemper     | Distressed   |                            |
| Mississippi | Lee        | Transitional |                            |
| Mississippi | Lowndes    | At-Risk      |                            |
| Mississippi | Marshall   | Distressed   |                            |
| Mississippi | Monroe     | At-Risk      |                            |
| Mississippi | Montgomery | Distressed   |                            |
| Mississippi | Noxubee    | Distressed   |                            |
| Mississippi | Oktibbeha  | At-Risk      |                            |
| Mississippi | Panola     | Distressed   |                            |
| Mississippi | Pontotoc   | Transitional |                            |
| Mississippi | Prentiss   | At-Risk      |                            |
| Mississippi | Tippah     | At-Risk      |                            |
| Mississippi | Tishomingo | At-Risk      |                            |
| Mississippi | Union      | Transitional |                            |
| Mississippi | Webster    | Distressed   |                            |
| Mississippi | Winston    | Distressed   |                            |
| Mississippi | Yalobusha  | Distressed   |                            |
| Mississippi | DISTRICT   |              | District 2 Northeast       |
| Mississippi | DISTRICT   |              | District 4 Tombigbee       |
| Mississippi | DISTRICT   |              | District 1 Northwest       |
| Mississippi | DISTRICT   |              | District 3 Delta Hills     |
| Mississippi | DISTRICT   |              | District 6 East<br>Central |

**Appendix B: Appalachian Regional Commission:  
Appalachian Counties & Economic Status By State – New York**

|          |             |              |  |
|----------|-------------|--------------|--|
| New York | Allegany    | At-Risk      |  |
| New York | Broome      | Transitional |  |
| New York | Cattaraugus | Transitional |  |
| New York | Chautauqua  | Transitional |  |
| New York | Chemung     | Transitional |  |
| New York | Chenango    | Transitional |  |
| New York | Cortland    | Transitional |  |
| New York | Delaware    | Transitional |  |
| New York | Otsego      | Transitional |  |
| New York | Schoharie   | Transitional |  |
| New York | Schuyler    | Transitional |  |
| New York | Steuben     | Transitional |  |
| New York | Tioga       | Transitional |  |
| New York | Tompkins    | Transitional |  |
| New York | DISTRICT    |              | Oneonta District<br>Health<br>Department |

**Appendix B: Appalachian Regional Commission:  
Appalachian Counties & Economic Status By State – North Carolina**

|                |            |              |                |              |                                 |
|----------------|------------|--------------|----------------|--------------|---------------------------------|
| North Carolina | Alexander  | Transitional | North Carolina | Transylvania | Transitional                    |
| North Carolina | Alleghany  | Transitional | North Carolina | Watauga      | Transitional                    |
| North Carolina | Ashe       | Transitional | North Carolina | Wilkes       | Transitional                    |
| North Carolina | Avery      | Transitional | North Carolina | Yadkin       | Transitional                    |
| North Carolina | Buncombe   | Transitional | North Carolina | Yancey       | At-Risk                         |
|                |            |              |                |              | Toe River District Health Dept. |
| North Carolina | Burke      | Transitional | North Carolina |              |                                 |
| North Carolina | Caldwell   | Transitional | North Carolina | Surry        | Transitional                    |
| North Carolina | Cherokee   | At-Risk      |                |              |                                 |
| North Carolina | Clay       | Transitional |                |              |                                 |
| North Carolina | Davie      | Competitive  |                |              |                                 |
| North Carolina | Forsyth    | Competitive  |                |              |                                 |
| North Carolina | Graham     | At-Risk      |                |              |                                 |
| North Carolina | Haywood    | Transitional |                |              |                                 |
| North Carolina | Henderson  | Competitive  |                |              |                                 |
| North Carolina | Jackson    | Transitional |                |              |                                 |
| North Carolina | McDowell   | Transitional |                |              |                                 |
| North Carolina | Macon      | Transitional |                |              |                                 |
| North Carolina | Madison    | Transitional |                |              |                                 |
| North Carolina | Mitchell   | At-Risk      |                |              |                                 |
| North Carolina | Polk       | Competitive  |                |              |                                 |
| North Carolina | Rutherford | At-Risk      |                |              |                                 |
| North Carolina | Stokes     | Transitional |                |              |                                 |

**Appendix B: Appalachian Regional Commission:  
Appalachian Counties & Economic Status By State – Ohio**

|      |            |              |
|------|------------|--------------|
| Ohio | Adams      | At-Risk      |
| Ohio | Ashtabula  | Transitional |
| Ohio | Athens     | Distressed   |
| Ohio | Belmont    | Transitional |
| Ohio | Brown      | Transitional |
| Ohio | Carroll    | Transitional |
| Ohio | Clermont   | Competitive  |
| Ohio | Columbiana | Transitional |
| Ohio | Coshocton  | Transitional |
| Ohio | Gallia     | At-Risk      |
| Ohio | Guernsey   | At-Risk      |
| Ohio | Harrison   | Transitional |
| Ohio | Highland   | Transitional |
| Ohio | Hocking    | Transitional |
| Ohio | Holmes     | Transitional |
| Ohio | Jackson    | At-Risk      |
| Ohio | Jefferson  | At-Risk      |
| Ohio | Lawrence   | At-Risk      |
| Ohio | Mahoning   | Transitional |
| Ohio | Meigs      | Distressed   |
| Ohio | Monroe     | Distressed   |
| Ohio | Morgan     | Distressed   |
| Ohio | Muskingum  | Transitional |
| Ohio | Noble      | At-Risk      |
| Ohio | Perry      | At-Risk      |
| Ohio | Pike       | Distressed   |
| Ohio | Ross       | Transitional |
| Ohio | Scioto     | At-Risk      |
| Ohio | Trumbull   | Transitional |
| Ohio | Tuscarawas | Transitional |
| Ohio | Vinton     | Distressed   |
| Ohio | Washington | Transitional |

**Appendix B: Appalachian Regional Commission:  
Appalachian Counties & Economic Status By State – Pennsylvania**

|              |            |              |              |                |                                       |
|--------------|------------|--------------|--------------|----------------|---------------------------------------|
| Pennsylvania | Allegheny  | Competitive  | Pennsylvania | Montour        | Competitive                           |
| Pennsylvania | Armstrong  | Transitional | Pennsylvania | Northumberland | Transitional                          |
| Pennsylvania | Beaver     | Transitional | Pennsylvania | Perry          | Competitive                           |
| Pennsylvania | Bedford    | Transitional | Pennsylvania | Pike           | Transitional                          |
| Pennsylvania | Blair      | Transitional | Pennsylvania | Sullivan       | Transitional                          |
| Pennsylvania | Bradford   | Transitional | Pennsylvania | Susquehanna    | Transitional                          |
| Pennsylvania | Butler     | Competitive  | Pennsylvania | Tioga          | Transitional                          |
| Pennsylvania | Cambria    | Transitional | Pennsylvania | Union          | Transitional                          |
| Pennsylvania | Cameron    | Transitional | Pennsylvania | Venango        | Transitional                          |
| Pennsylvania | Carbon     | Transitional | Pennsylvania | Warren         | Transitional                          |
| Pennsylvania | Centre     | Transitional | Pennsylvania | Washington     | Competitive                           |
| Pennsylvania | Clarion    | Transitional | Pennsylvania | Wayne          | Transitional                          |
| Pennsylvania | Clearfield | Transitional | Pennsylvania | Westmoreland   | Competitive                           |
| Pennsylvania | Clinton    | Transitional | Pennsylvania | Wyoming        | Transitional                          |
| Pennsylvania | Columbia   | Transitional | Pennsylvania | DISTRICT       | Northcentral<br>District              |
| Pennsylvania | Crawford   | Transitional | Pennsylvania | DISTRICT       | Northeast<br>District                 |
| Pennsylvania | Elk        | Competitive  | Pennsylvania | DISTRICT       | Northwest<br>District                 |
| Pennsylvania | Erie       | Transitional | Pennsylvania | DISTRICT       | Southcentral<br>Southeast<br>District |
| Pennsylvania | Fayette    | At-Risk      | Pennsylvania | DISTRICT       | Southwest<br>District                 |
| Pennsylvania | Forest     | Distressed   | Pennsylvania | DISTRICT       |                                       |
| Pennsylvania | Fulton     | Transitional |              |                |                                       |
| Pennsylvania | Greene     | Transitional |              |                |                                       |
| Pennsylvania | Huntingdon | Transitional |              |                |                                       |
| Pennsylvania | Indiana    | Transitional |              |                |                                       |
| Pennsylvania | Jefferson  | Transitional |              |                |                                       |
| Pennsylvania | Juniata    | Transitional |              |                |                                       |
| Pennsylvania | Lackawanna | Transitional |              |                |                                       |
| Pennsylvania | Lawrence   | Transitional |              |                |                                       |
| Pennsylvania | Luzerne    | Transitional |              |                |                                       |
| Pennsylvania | Lycoming   | Transitional |              |                |                                       |
| Pennsylvania | McKean     | Transitional |              |                |                                       |
| Pennsylvania | Mercer     | Transitional |              |                |                                       |
| Pennsylvania | Mifflin    | Transitional |              |                |                                       |
| Pennsylvania | Monroe     | Transitional |              |                |                                       |

**Appendix B: Appalachian Regional Commission:  
Appalachian Counties & Economic Status By State – South Carolina**

|                   |             |              |
|-------------------|-------------|--------------|
| South<br>Carolina | Anderson    | Transitional |
| South<br>Carolina | Cherokee    | At-Risk      |
| South<br>Carolina | Greenville  | Transitional |
| South<br>Carolina | Oconee      | Transitional |
| South<br>Carolina | Oconee      | Transitional |
| South<br>Carolina | Pickens     | Transitional |
| South<br>Carolina | Spartanburg | Transitional |

**Appendix B: Appalachian Regional Commission:  
Appalachian Counties & Economic Status By State – Tennessee**

|           |            |              |
|-----------|------------|--------------|
| Tennessee | Anderson   | Transitional |
| Tennessee | Bledsoe    | At-Risk      |
| Tennessee | Blount     | Transitional |
| Tennessee | Bradley    | Transitional |
| Tennessee | Campbell   | At-Risk      |
| Tennessee | Cannon     | Transitional |
| Tennessee | Carter     | At-Risk      |
| Tennessee | Claiborne  | At-Risk      |
| Tennessee | Clay       | Distressed   |
| Tennessee | Cocke      | Distressed   |
| Tennessee | Coffee     | Transitional |
| Tennessee | Cumberland | Transitional |
| Tennessee | DeKalb     | Transitional |
| Tennessee | Fentress   | Distressed   |
| Tennessee | Franklin   | Transitional |
| Tennessee | Grainger   | At-Risk      |
| Tennessee | Greene     | Transitional |
| Tennessee | Grundy     | Distressed   |
| Tennessee | Hamblen    | Transitional |
| Tennessee | Hamilton   | Transitional |
| Tennessee | Hancock    | Distressed   |
| Tennessee | Hawkins    | Transitional |
| Tennessee | Jackson    | At-Risk      |
| Tennessee | Jefferson  | Transitional |
| Tennessee | Johnson    | Distressed   |
| Tennessee | Knox       | Competitive  |
| Tennessee | Lawrence   | Distressed   |
| Tennessee | Lewis      | At-Risk      |
| Tennessee | Loudon     | Competitive  |
| Tennessee | McMinn     | Transitional |
| Tennessee | Macon      | Transitional |
| Tennessee | Marion     | Transitional |
| Tennessee | Meigs      | At-Risk      |
| Tennessee | Monroe     | Transitional |
| Tennessee | Morgan     | At-Risk      |
| Tennessee | Overton    | At-Risk      |



|           |            |              |                                       |
|-----------|------------|--------------|---------------------------------------|
| Tennessee | Pickett    | Distressed   |                                       |
| Tennessee | Polk       | Transitional |                                       |
| Tennessee | Putnam     | Transitional |                                       |
| Tennessee | Rhea       | At-Risk      |                                       |
| Tennessee | Roane      | Transitional |                                       |
| Tennessee | Scott      | Distressed   |                                       |
| Tennessee | Sequatchie | Transitional |                                       |
| Tennessee | Sevier     | Transitional |                                       |
| Tennessee | Smith      | Transitional |                                       |
| Tennessee | Sullivan   | Transitional |                                       |
| Tennessee | Unicoi     | Transitional |                                       |
| Tennessee | Union      | At-Risk      |                                       |
| Tennessee | Van Buren  | At-Risk      |                                       |
| Tennessee | Warren     | At-Risk      |                                       |
| Tennessee | Washington | Transitional |                                       |
| Tennessee | White      | At-Risk      |                                       |
| Tennessee | DISTRICT   |              | East Tennessee Regional Health Dept   |
| Tennessee | DISTRICT   |              | Mid-Cumberland Regional Health Dept   |
| Tennessee | DISTRICT   |              | Northeast Regional Health Dept        |
| Tennessee | DISTRICT   |              | Southeast Regional Health Dept        |
| Tennessee | DISTRICT   |              | Upper Cumberland Regional Health Dept |

**Appendix B: Appalachian Regional Commission:  
Appalachian Counties & Economic Status By State – Virginia**

|          |   |                    |
|----------|---|--------------------|
| Virginia | Alleghany + Clifton Forge city + Covington city | Transitional       |
| Virginia | Bath  | Competitive        |
| Virginia | Bland   | Transitional       |
| Virginia | Botetourt                                       | Attainment         |
| Virginia | Buchanan  | At-Risk            |
| Virginia | Carroll + Galax city                            | Transitional       |
| Virginia | Craig   | Transitional       |
| Virginia | Dickenson                                       | Distressed         |
| Virginia | Floyd   | Transitional       |
| Virginia | Giles   | Transitional       |
| Virginia | Grayson   | Transitional       |
| Virginia | Henry + Martinsville city                       | Transitional       |
| Virginia | Highland  | Transitional       |
| Virginia | Lee   | At-Risk            |
| Virginia | Montgomery + Radford city                       | Transitional       |
| Virginia | Patrick   | Transitional       |
| Virginia | Pulaski   | Transitional       |
| Virginia | Rockbridge + Buena Vista city + Lexington city  | Transitional       |
| Virginia | Russell   | At-Risk            |
| Virginia | Scott   | At-Risk            |
| Virginia | Smyth   | Transitional       |
| Virginia | Tazewell  | Transitional       |
| Virginia | Washington + Bristol city                       | Transitional       |
| Virginia | Wise + Norton city                              | At-Risk            |
| Virginia | Wythe   | Transitional       |
| Virginia | DISTRICT  | Cumberland Plateau |
| Virginia | DISTRICT  | Alleghany          |
| Virginia | DISTRICT  | Central Shenandoah |
| Virginia | DISTRICT  | Mount Rogers       |
| Virginia | DISTRICT  | New River          |
| Virginia | DISTRICT  | West Piedmont      |
| Virginia | DISTRICT  | Lenowisco          |

**Appendix B: Appalachian Regional Commission:  
Appalachian Counties & Economic Status By State – West Virginia**

|               |            |              |               |          |                    |
|---------------|------------|--------------|---------------|----------|--------------------|
| West Virginia | Barbour    | At-Risk      |               |          |                    |
| West Virginia | Berkeley   | Transitional |               |          |                    |
| West Virginia | Boone      | At-Risk      |               |          |                    |
| West Virginia | Braxton    | Distressed   |               |          |                    |
| West Virginia | Brooke     | Transitional |               |          |                    |
| West Virginia | Cabell     | Transitional |               |          |                    |
| West Virginia | Calhoun    | Distressed   |               |          |                    |
| West Virginia | Clay       | Distressed   |               |          |                    |
| West Virginia | Doddridge  | At-Risk      |               |          |                    |
| West Virginia | Fayette    | At-Risk      |               |          |                    |
| West Virginia | Gilmer     | At-Risk      |               |          |                    |
| West Virginia | Grant      | Transitional |               |          |                    |
| West Virginia | Greenbrier | At-Risk      |               |          |                    |
| West Virginia | Hampshire  | Transitional |               |          |                    |
| West Virginia | Hancock    | Transitional |               |          |                    |
| West Virginia | Hardy      | Transitional |               |          |                    |
| West Virginia | Harrison   | Transitional |               |          |                    |
| West Virginia | Jackson    | Transitional |               |          |                    |
| West Virginia | Jefferson  | Competitive  |               |          |                    |
| West Virginia | Kanawha    | Transitional |               |          |                    |
| West Virginia | Lewis      | At-Risk      |               |          |                    |
| West Virginia | Lincoln    | Distressed   |               |          |                    |
| West Virginia | Logan      | At-Risk      |               |          |                    |
| West Virginia | McDowell   | Distressed   |               |          |                    |
| West Virginia | Marion     | Transitional |               |          |                    |
| West Virginia | Marshall   | Transitional | West Virginia | Wirt     | Distressed         |
| West Virginia | Mason      | At-Risk      | West Virginia | Wood     | Transitional       |
| West Virginia | Mercer     | At-Risk      | West Virginia | Wyoming  | Distressed         |
| West Virginia | Mineral    | Transitional | West Virginia | DISTRICT | Mid-Ohio<br>Valley |
| West Virginia | Mingo      | Distressed   |               |          |                    |
| West Virginia | Monongalia | Transitional |               |          |                    |
| West Virginia | Monroe     | At-Risk      |               |          |                    |
| West Virginia | Morgan     | Transitional |               |          |                    |
| West Virginia | Nicholas   | At-Risk      |               |          |                    |
| West Virginia | Ohio       | Transitional |               |          |                    |
| West Virginia | Pendleton  | Transitional |               |          |                    |

|               |            |              |
|---------------|------------|--------------|
| West Virginia | Pleasants  | Transitional |
| West Virginia | Pocahontas | At-Risk      |
| West Virginia | Preston    | Transitional |
| West Virginia | Putnam     | Competitive  |
| West Virginia | Raleigh    | Transitional |
| West Virginia | Randolph   | Transitional |
| West Virginia | Ritchie    | At-Risk      |
| West Virginia | Roane      | Distressed   |
| West Virginia | Summers    | Distressed   |
| West Virginia | Taylor     | At-Risk      |
| West Virginia | Tucker     | At-Risk      |
| West Virginia | Tyler      | At-Risk      |
| West Virginia | Upshur     | At-Risk      |
| West Virginia | Wayne      | At-Risk      |
| West Virginia | Webster    | Distressed   |
| West Virginia | Wetzel     | At-Risk      |

## **Appendix C: Invitation to Participate in Study & Informed Consent Statement**

Invitation to participate in research cover letter.

**You are invited to participate in an academic research survey especially for public health educators. If you are not a health educator, please feel free to pass this along to a health educator working in your local or district health department.**

**I am a doctoral student at The University of Tennessee. This survey is for my dissertation research on the role of information in the work of public health educators working in Appalachian counties. By participating in this survey, you will be contributing valuable insights about your experiences and attitudes as a health educator, which will significantly enhance my understanding of your important work promoting good health and improved quality of life in your community. The ultimate goal of this research is to improve health educators' access to the information they may need for their work.**

**Completing the questionnaire is simple to do and will only take about 15 minutes of your time. You may use the enclosed paper questionnaire and return it in the prestamped envelope, or you may take the survey online at: [deleted]**

**Either way, your responses will be kept strictly confidential. They will be combined with responses from many other people, solely for the purposes of general statistical analysis.**

**In appreciation for your time spent on the survey, you have the opportunity to win an Ipod Nano, which will be awarded in a random prize drawing among all participating survey respondents. Please note that entering the drawing will not affect the anonymity of your responses.**

**Additional information about the study is available on the enclosed Informed Consent statement. Please complete and return the questionnaire as soon as possible. Your return of the questionnaire will constitute your informed consent to participate in the study. If you have any questions, please contact me at the phone number or email address listed above. I really appreciate your help with this research.**

## INFORMED CONSENT STATEMENT

Project Name: “The Information Behavior of Public Health Educators Working in Appalachia”

### INTRODUCTION

You are invited to participate in a research study about the information needs and information-seeking behavior of public health educators who are working in ARC-designated Appalachian counties or regions. The study seeks to develop an understanding of what kinds of information needs these health educators experience in the course of their work, and what kinds of resources they turn to, to meet their needs. The findings will help to inform the development of improved tools or resources to enhance the information environment of public health educators.

### INFORMATION ABOUT PARTICIPANTS’ INVOLVEMENT IN THE STUDY

Your participation in the study involves completing the attached survey questionnaire, and returning it by mail in the prepared envelope provided. Alternatively, you may complete the online version of the survey, which is available at [deleted]

Please complete the survey only once, using your choice of either the paper questionnaire or the online version, but not both. It is estimated that completing the survey will take no more than 20 minutes.

### RISKS

Because participation is limited to completing a survey, there are no foreseeable risks to the participants from their involvement in the study.

### BENEFITS

It is anticipated that this research will benefit the participants by extending the body of knowledge about informational aspects of the work of public health educators, an essential step in determining whether their information needs are being met, and what kind of additional resources, systems, training, or support from other professionals would facilitate their work. Because public health educators disseminate important messages about health promotion and disease prevention to the public, this research will also benefit the residents of Appalachia, by helping health educators to serve them more effectively.

### CONFIDENTIALITY

The information in the study records will be kept confidential. Data will be stored securely and will be made available only to the researcher conducting the study and members of her doctoral committee, unless participants specifically give permission in writing to do otherwise. Data from the survey will only be reported in aggregate terms; no reference will be made in oral or written reports that could link participants to the study. Questions about the location (state and county/region) in which the participant works are being asked for the sole purpose of determining participation levels and the need for sending follow-up requests for participation. Identification numbers on each questionnaire are being used to separate participants’ responses on the various measures from the location of their work.

## COMPENSATION

For participating in the study, all survey respondents who complete the questionnaire will be entered in a chance drawing for an Ipod Nano. Please note that personal information for the Ipod drawing is kept separate from both the Informed Consent form and the survey data, to protect your confidentiality. Participants who do not complete and return the survey, or who withdraw prior to completing the survey will not be entered in the drawing. Participants who complete the online survey have the same chance of winning the Ipod as those who complete the paper questionnaire.

## EMERGENCY MEDICAL TREATMENT

The University of Tennessee does not “automatically” reimburse participants for medical claims or other compensation. The risk of participating in this study is minimal, so no need for emergency medical treatment is anticipated. If physical injury is suffered during the course of research, or for more information, please notify the investigator in charge: Kitty McClanahan, School of Information Sciences, at (865) 974-2148.

## CONTACT INFORMATION

If you have questions at any time about the study or procedures, (or if you experience adverse effects as a result of participating in this study), you may contact the researcher, Kitty McClanahan, at The University of Tennessee’s School of Information Sciences, 451 Communications Building, 1345 Circle Park Drive, Knoxville, TN, 37996-0341, and (865) 974-2148. If you have questions about your rights as a participant, contact the Office of Research Compliance Officer at (865) 974-3466.

## PARTICIPATION

Your participation in this study is voluntary; you may decline to participate without penalty. If you decide to participate, you may withdraw from the study at any time without penalty and without loss of benefits to which you are otherwise entitled. If you withdraw from the study before data collection is completed your data will be returned to you or destroyed.

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## **Appendix D: Scripts for Telephone Interviews**

### **Telephone Follow-up Scripts for Initial Mailed Survey:**

#### **SCRIPT OPTIONS IF HEALTH EDUCATOR IS REACHED BY PHONE:**

Hello, this is Kitty McClanahan, a doctoral student from the University of Tennessee. Recently you should have received a survey in the mail about the role of information in your work as a public health educator. Did you receive that survey in the mail?

(IF YES) Did you have a chance to complete and mail back the questionnaire, or maybe take the survey online? (IF YES TO EITHER OPTION) Thank you so much! I really appreciate your taking the time to participate in my survey.

(IF YES TO RECEIVING IT BUT NO TO COMPLETING IT) Your participation in this survey is very important to me, as I am gathering responses from public health educators like you, who are doing important work in each of the counties in Appalachia. I would really like to include your thoughts and opinions as well. You can go ahead and complete the paper survey, or if you prefer, I can send you an email with the link to the online version of the survey for you to use. Or, if you have some time now, I could read the questions to you over the phone and record your answers. It will take about 15 to 20 minutes. If you would like to do the survey over the phone and this is not a convenient time, is there a better time for me to call you back to do the survey?

(IF NO TO RECEIVING IT) I'm sorry to hear that you didn't receive the survey. Your participation in this survey is very important to me, as I am gathering responses from public health educators like you, who are doing important work in each of the counties in Appalachia. I would really like to include your thoughts and opinions as well. Which way would you like to participate? I can send you another copy of the paper survey, or if you prefer, I can send you an email with the link to the online version of the survey for you to use. Or, if you have some time now, I could read the questions to you over the phone and record your answers. It will take about 15 to 20 minutes. If you would like to do the survey over the phone and this is not a convenient time, is there a better time for me to call you back to do the survey?

(IF NOT RECEIVED, AND EMAIL OR TELEPHONE OPTION ARE REFUSED) I understand how busy you are. If it is ok with you, I would like to try to send you another copy of the paper survey, which you can complete at your convenience. May I confirm your correct address?

#### **SCRIPT OPTIONS IF VOICE MAIL IS REACHED:**

Hello, this is Kitty McClanahan, a doctoral student from the University of Tennessee. Recently you should have received a survey in the mail about the role of information in your work as a public health educator. I'm calling to confirm that you received the



survey, and to see if you have any questions about it. Your participation in this survey is very important to me, as I am gathering responses from public health educators like you, who are doing important work in each of the counties in Appalachia. I would really like to include your thoughts and opinions as well.

You can either use the paper questionnaire, or use the link to the online survey that is mentioned in the cover letter, or I can call you back at a convenient time to do the survey over the phone. You can reach me by email at [kmccclan3@utk.edu](mailto:kmccclan3@utk.edu) or by phone at [deleted]. I will try calling you again in a few days. Thanks!

#### SCRIPT IF RECEPTIONIST IS REACHED BY PHONE:

Hello, this is Kitty McClanahan, a doctoral student from the University of Tennessee. I am following up on a survey I recently mailed to (Health Educator). Does (he/she) have an email address I could use to confirm if (he/she) received the survey, or has any questions about it? (IF NO EMAIL) What is the best time for me to call back to reach (him/her)? I am gathering responses from public health educators like (him/her) from all over Appalachia, and I don't want (his/her) thoughts and opinions to be left out. (Health Educator) can reach me by phone at [deleted]. I will try calling (him/her) again in a few days. Thanks!

## Appendix E: Survey Instrument

“The Information Behavior of Public Health Educators Working in Appalachia”

This brief research survey explores the role of information in the work of public health educators in Appalachian counties. The ultimate goal of this research is to improve health educators’ access to the information they may need for their work. Your participation in this survey is very important to me. Please share your valuable insights and opinions through your responses to each of these questions.

**A health educator communicates health information and develops and/or presents instructional programs to community members that promote wellness, healthful behavior, and disease prevention.**

S1a. . Do you work as a health educator? ( )Yes ( )No

[IF YES, GO TO S1b. IF NO, PLEASE DISCONTINUE THE SURVEY, AND FORWARD IT TO A COLLEAGUE WHO IS A HEALTH EDUCATOR.]

S1b. Which one of the following responses best describes your work setting?

I am a health educator working for...

- |                                       |                                 |
|---------------------------------------|---------------------------------|
| ( ) A public health department        | ( ) A school or school district |
| ( ) A college or university           | ( ) A private organization      |
| ( ) Another kind of government agency | ( ) Other [Please Specify]      |

\_\_\_\_\_

**As a first step, please tell me a little bit about yourself...**

D1. Which state do you work in? \_\_\_\_\_

D2. What is the name of the county that you work in? If your work area is a region or district rather than a county, please provide that name instead.

\_\_\_\_\_

D3. Which of the following kinds of academic training and/or certification in health education do you have? (Check all that apply, and fill in the year the credential was earned).

Year Earned

- |  |       |
|--|-------|
| ( ) Associates (2-year) degree or certification  | _____ |
| ( ) Certified Health Education Specialist (CHES) | _____ |
| ( ) Master of Public Health (MPH)                | _____ |
| ( ) Teaching degree                              | _____ |
| ( ) Major in Health Education                    | _____ |
| ( ) Nursing degree                               | _____ |
| ( ) Other degree (Please specify)_____           | _____ |

( ) No specialized health or teaching degree.

D4. What is your age? \_\_\_\_\_

D5. What is your sex? ( ) Male ( )Female

The questions in this section address what your work as a health educator is like, and how often you need to find information for your work.

Q1. How would you characterize your work as a health educator? Over the course **of the past year, think about how often your work involved each of the following activities.** How often did the activity occur?  
Occas-

|   | (10 or more times per yr) | (6 to 9 times) | (3 to5 times) | (Once or twice a yr) | ( ) |
|---|---------------------------|----------------|---------------|----------------------|-----|
| Preparing for or delivering a program program created by a health authority (like the CDCP) to an audience. | ( )                       | ( )            | ( )           | ( )                  | ( ) |
| Dealing with telephone calls from members of the public who have health questions.                          | ( )                       | ( )            | ( )           | ( )                  | ( ) |
| Assessing your community's health education needs.  | ( )                       | ( )            | ( )           | ( )                  | ( ) |
| Developing &/or presenting an original program to address a health issue in your community.                 | ( )                       | ( )            | ( )           | ( )                  | ( ) |
| Evaluating the effectiveness of a program after it has been implemented.                                    | ( )                       | ( )            | ( )           | ( )                  | ( ) |
| Writing grants or engaging in other activities to obtain funding.   | ( )                       | ( )            | ( )           | ( )                  | ( ) |
| Working with coalitions of people to address community health needs.  | ( )                       | ( )            | ( )           | ( )                  | ( ) |
| Looking for health-related information to assist you with any of the activities listed above.               | ( )                       | ( )            | ( )           | ( )                  | ( ) |

Q2. Now think about how likely each of these activities is to **create an information need** for you. (An information need is when you must go beyond your own knowledge and consult an information source like printed or online material or another person.) When you are typically doing each of the following activities, please indicate **how likely it is to prompt you to consult an information source. Out of ten times that you do the activity, how many times would it create an information need?**

|   | Always<br>(10 of 10) | Usually<br>(6-9) | Occas-<br>ionally<br>(3-5) | Rarely<br>(1 or 2) | Never<br>(0 ) | I don't do<br>this activity |
|---|----------------------|------------------|----------------------------|--------------------|---------------|-----------------------------|
| Preparing for or delivering a program created by a health authority (like the CDCP) to an audience. | ( )                  | ( )              | ( )                        | ( )                | ( )           | ( )                         |
| Dealing with telephone calls from members of the public who have health questions.                  | ( )                  | ( )              | ( )                        | ( )                | ( )           | ( )                         |
| Assessing your community's health education needs.  | ( )                  | ( )              | ( )                        | ( )                | ( )           | ( )                         |
| Developing &/or presenting an original program to address a health issue in your community.         | ( )                  | ( )              | ( )                        | ( )                | ( )           | ( )                         |
| Evaluating the effectiveness of a program after it has been implemented.                            | ( )                  | ( )              | ( )                        | ( )                | ( )           | ( )                         |
| Fielding questions from people attending your presentations.  | ( )                  | ( )              | ( )                        | ( )                | ( )           | ( )                         |
| Writing grants or engaging in other activities to obtain funding.                                   | ( )                  | ( )              | ( )                        | ( )                | ( )           | ( )                         |
| Working with coalitions of people to address community health needs.                                | ( )                  | ( )              | ( )                        | ( )                | ( )           | ( )                         |

Q3. Which one of the statements below most accurately reflects your time spent delivering programs?  
[SELECT ONLY ONE]

- ( ) I spend much more time delivering prepackaged programs (like those from the CDCP) than delivering original programs (those that I have developed).
- ( ) I spend somewhat more time delivering prepackaged programs than delivering original programs.
- ( ) I spend about an equal amount of time on delivering prepackaged programs and original programs.
- ( ) I spend somewhat more time delivering original programs than delivering prepackaged programs.

I spend much more time delivering original programs than delivering prepackaged programs.

Q4. Which one of the following two statements best describes the focus of your work as a health educator?  
[SELECT ONLY ONE]

My efforts tend to be focused on addressing a few specific health challenges that are especially prominent in the community I serve.

My efforts are dispersed across a wide variety of health challenges that exist in the community I serve.

The questions in the next section relate to how you feel about finding and evaluating information related to your work.

Q5. When you experience a need for information related to your work as a health educator, how would you rate your information-seeking ability? [SELECT ONLY ONE]

Excellent

Very Good

Adequate

Lower than I want it to be

Poor

Q6. Once you have found some information, how would you rate your ability to evaluate the **quality** of that information? (Evaluating information quality includes making a judgment about the reliability and authority of the source of the information, as well as the appropriateness and completeness of the information in addressing your information need.) [SELECT ONLY ONE]

Excellent

Very Good

Adequate

Lower than I want it to be

Poor

Q7a. Have you ever had formal training in how to use electronic information sources to meet your professional information needs? (Examples of electronic information sources are online databases of health information like WebMD, or electronic journal articles, or websites for organizations such as the American Cancer Society or the Centers for Disease Control & Prevention (CDCP)).

Yes

No

[IF YES, ANSWER QUESTIONS 7b & 7c. IF NO, SKIP TO QUESTION 8.]

Q7b. Under what circumstances did you receive the training? Pick the **one** statement below that best describes your experience.

I received this training as part of an academic degree program.

I received this training as professional development for my job.

I received this training both as professional development and as part of an academic degree program.

I received this training under other circumstances. (Please specify):

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Q7c. How satisfied are you with the formal training you have received in using electronic information sources to meet your professional information needs?

- Very satisfied  
 Somewhat satisfied  
 Somewhat dissatisfied  
 Very dissatisfied

The questions in the next section explore what kinds of actions you may take in the event that you need to find some information to perform your work as a health educator. Other questions ask about information sources you might use to obtain the information you need.

Q8. For your work as a health educator, do you have access to the Internet/World Wide Web? [SELECT ONLY ONE ANSWER].

Yes, I have high-speed Internet access   
(via cable, satellite, or DSL)

Yes, I have dial-up Internet access (a slower way to connect that uses a telephone line)

No, I don't have Internet access

Q9. **How often do you use each of the following information sources** in relation to your work as a health educator? Think about the information needs you have experienced **over the past year**, and what sources you chose to address them. **Did the use occur...**

|   | Occas-                       |                          |                          |                          |                          |
|---|------------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
|   | (10 or more<br>times per yr) | (6 to 9<br>times)        | (3 to 5<br>times)        | (Once or<br>twice a yr)  | Never                    |
| Consulting medical or reference books that you own  | <input type="checkbox"/>     | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Asking a doctor, nurse, or other healthcare professional                                    | <input type="checkbox"/>     | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Searching websites of health-related organizations like the CDCP or American Cancer Society | <input type="checkbox"/>     | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

|  |     |     |     |     |     |
|--|-----|-----|-----|-----|-----|
| Using printed resources available from a medical, health, or public library            | ( ) | ( ) | ( ) | ( ) | ( ) |
| Asking a medical or health science librarian for assistance in finding the information | ( ) | ( ) | ( ) | ( ) | ( ) |

Q9 (Continued).

|  | (10 or more times per yr) | (6 to 9 times) | (3 to 5 times) | Occas-<br>(Once or twice a yr) | Never |
|--|---------------------------|----------------|----------------|--------------------------------|-------|
| Searching for information available on the Internet                                    | ( )                       | ( )            | ( )            | ( )                            | ( )   |
| Using a library's electronic databases of health information, such as journal articles | ( )                       | ( )            | ( )            | ( )                            | ( )   |
| Other information source (please specify)  | ( )                       | ( )            | ( )            | ( )                            | ( )   |

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Q10. Think of the same list of information sources and how you have used them in relation to your work as a health educator. After a typical experience using each source, how satisfied are you with the information you receive from this source?

|   | Very Satisfied | Satis-<br>fied | Dis-<br>satisfied | Very Dis-<br>satisfied | Never<br>used it |
|---|----------------|----------------|-------------------|------------------------|------------------|
| Consulting medical or reference books that you own  | ( )            | ( )            | ( )               | ( )                    | ( )              |
| Asking a doctor, nurse, or other healthcare professional                                    | ( )            | ( )            | ( )               | ( )                    | ( )              |
| Searching websites of health-related organizations like the CDCP or American Cancer Society | ( )            | ( )            | ( )               | ( )                    | ( )              |
| Using Printed resources available from a medical, health, or public library                 | ( )            | ( )            | ( )               | ( )                    | ( )              |
| Asking a medical or health science librarian for assistance in finding the information      | ( )            | ( )            | ( )               | ( )                    | ( )              |
| Searching for information available on the Internet   | ( )            | ( )            | ( )               | ( )                    | ( )              |

Using a library's electronic databases of health information, such as journal articles ( ) ( ) ( ) ( ) ( )

Other information source (please specify) ( ) ( ) ( ) ( ) ( )

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Q11. Think of the same list of information sources. When you experience a need for information related to your work as a health educator, **which of the following information sources are you most likely to use first?** [SELECT ONLY ONE]

First Choice

Consulting medical or reference books that you own ( )

Asking a doctor, nurse, or other healthcare professional ( )

Searching websites of health-related organizations like the CDCP or American Cancer Society ( )

Using printed resources available from a medical, health, or public library ( )

Asking a medical or health science librarian for assistance in finding the information ( )

Searching for information available on the Internet ( )

Using a library's electronic databases of health information, such as journal articles ( )

Other information source (please specify) ( )

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Q12. For your work as a health educator, how often have you **used a library or library resources to address the information needs you have experienced over the past year?** For each of the methods for accessing a library listed below, did the use occur... (If a particular kind of library or library resource is not available to you, check "No Access".)

Fre-

Occas-



|   | requently<br>(10 or more<br>times per yr) | Often<br>(6 to 9<br>times) | ionally<br>(3 to5<br>times) | Rarely<br>(Once or<br>twice a yr) | Never | No<br>Access |
|---|---|----------------------------|-----------------------------|-----------------------------------|-------|--------------|
| Visiting (in person) a health or medical library at a hospital, university, or medical center | ( )                                       | ( )                        | ( )                         | ( )                               | ( )   | ( )          |
| Accessing electronic information resources of a health or medical library                     | ( )                                       | ( )                        | ( )                         | ( )                               | ( )   | ( )          |
| Visiting a public library that has health or medical resources available                      | ( )                                       | ( )                        | ( )                         | ( )                               | ( )   | ( )          |

Q. 12 (Continued)...

|  | Fre-<br>quently<br>(10 or more<br>times per yr) | Often<br>(6 to 9<br>times) | Occas-<br>ionally<br>(3 to5<br>times) | Rarely<br>(Once or<br>twice a yr) | Never | No<br>Access |
|--|---|----------------------------|---------------------------------------|-----------------------------------|-------|--------------|
| Accessing electronic information resources of a public library                                   | ( )   | ( )                        | ( )                                   | ( )                               | ( )   | ( )          |
| Visiting a community college library that has health or medical resources available              | ( )   | ( )                        | ( )                                   | ( )                               | ( )   | ( )          |
| Accessing electronic information resources of a community college library                        | ( )   | ( )                        | ( )                                   | ( )                               | ( )   | ( )          |
| Asking a health or medical librarian in person for help finding information                      | ( )   | ( )                        | ( )                                   | ( )                               | ( )   | ( )          |
| Using email, phone, or a library chat room service to ask a health or medical librarian for help | ( )   | ( )                        | ( )                                   | ( )                               | ( )   | ( )          |
| Visiting or accessing electronic resources of another kind of library (Please specify)           | ( )   | ( )                        | ( )                                   | ( )                               | ( )   | ( )          |

Q13. Below are a list of statements that health educators might make about their information needs and access to sources. Please think about your own experiences and beliefs, and indicate how much you either agree or disagree with each statement.

Strongly Agree      Agree      Disagree      Strongly Disagree

When I first hear about a new health issue, I like to do a general search on the Internet (e.g., “google it”) to learn more about the topic. ( ) ( ) ( ) ( )

I limit how much health information seeking I do for my work, because I am not a medical professional like a doctor or nurse. ( ) ( ) ( ) ( )

The Internet access to health information resources provided at my workplace is **not adequate** for me to meet all my information needs. ( ) ( ) ( ) ( )

Q. 13 (Continued)...

|   | Strongly<br>Agree | Agree | Disagree | Strongly<br>Disagree |
|---|-------------------|-------|----------|----------------------|
| When I research a health topic online, I usually restrict my search to specific websites I am very familiar with. ( ) ( ) ( ) ( )                         | ( )               | ( )   | ( )      | ( )                  |
| If I can't find the health information I need for my work, getting the help of a health or medical librarian is a good alternative. ( ) ( ) ( ) ( )       | ( )               | ( )   | ( )      | ( )                  |
| I am interested in learning more about using information technology that would make it easier for me to serve my community. ( ) ( ) ( ) ( )               | ( )               | ( )   | ( )      | ( )                  |
| When I use a library, I prefer working with printed materials like books and journals over using their electronic journals and databases. ( ) ( ) ( ) ( ) | ( )               | ( )   | ( )      | ( )                  |

For the final two questions below, please feel free to tell me, in your own words, your thoughts about how your access to information could be improved, and anything else you would like to share about this topic.

Q14. What kinds of information-related sources, technology, training, or other resources would make it easier for you to do your work as a health educator?

Q15. Is there anything else you would like to say about the information-related aspects of your job?

Thank you for completing the survey! Please use the enclosed stamped, pre-addressed envelope to mail in your survey, at your earliest convenience. Please keep the copy of the Informed Consent form for your records.

Do you want to be included in the drawing for the Ipod Nano? Please enter your name and delivery information on the following page. To preserve your confidentiality, this entry sheet will be immediately separated from the questionnaire upon receipt. It will be stored with other drawing entries, and will not be able to be associated with your responses to the questionnaire.

## Entry for Drawing for Ipod Nano

Thank you so much for participating in this research study! At the conclusion of the data-gathering phase of the study, one entry will be drawn randomly from the pool of respondents who elected to enter the drawing for the Ipod. To enter the drawing, please provide your name and the address where you would like the prize to be shipped, by US Priority Mail.

Name\_\_\_\_\_

Address\_\_\_\_\_

City\_\_\_\_\_ State\_\_\_\_\_ Zip\_\_\_\_\_

I am committed to protecting the privacy of your responses. To preserve your confidentiality, your entry information will be separated from the questionnaire immediately upon receipt. It will be stored with other drawing entries, and will not be able to be associated with your responses to the questionnaire. Entering the drawing will not compromise your privacy in any way.

## **Appendix F: Invitation to Participate in Pilot Test of Survey**

Text of the invitation sent via email:

I am a Ph.D. student in Information Science at UT Knoxville. Would you be interested in participating in a pilot survey for my dissertation research? The topic is the role of information in the work of health educators working for public health departments in Appalachian counties. However, for the pilot survey, I need the help of health educators like you who work in other settings. (Feel free to forward this to other health educators you think might be interested, as long as they do not work for a health department.)

If you can spare 15 minutes or so to take the online survey, I would be very grateful! Just click on the link below. Also, if you decide to participate in the prize drawing mentioned in the survey, you may win a \$25 gift certificate for a store or online store of your choice. Since only about ten people have been recruited for the pilot, your odds of winning the drawing are quite favorable! (Please note that the survey promises an Ipod as an incentive, but unfortunately that is only for the full survey, thanks to my student-size budget ☺).

Please be assured that your responses will be kept strictly confidential. Entering the drawing will not affect the anonymity of your responses, as the drawing information and the survey responses are automatically separated upon submission.

Please share your valuable insights about your experiences and attitudes as a health educator, to enhance my understanding of your important work promoting good health and improved quality of life. If you have any questions or concerns, please contact me at [kmclan3@utk.edu](mailto:kmclan3@utk.edu). Thank you so much!

[Survey link deleted]

### **Appendix G: Email Announcement of Study Sent To LHD Directors**

This is the text of the email sent to identified directors of the local health department offices in Appalachia, soon after the paper survey was mailed, in order to secure their endorsement of the survey and encouragement to their health educators to complete the survey.

Text of email:

I am a Ph.D. student at the University of Tennessee, studying information science and public health. My dissertation research is about how public health educators, who work at public health departments in Appalachian counties/districts, use information for their work. The ultimate purpose of the research is to benefit health educators by improving their access to any information they may need for their important work in promoting good health and disease prevention.

Recently, I mailed a paper survey to your office, generally addressed to any health educator working at that location. (Some mailings may have been addressed to a specific health educator, if I had that information.) How many health educators (or health promotion specialists) work out of your office? I would be grateful for any information about this, and any encouragement that you might be willing to provide to your health educator(s) to facilitate the completion and return of the survey. In pilot studies, the survey only took about 15-20 minutes to complete. The health educator can either mail the paper copy to me (a pre-stamped envelope is provided) or he/she can take the survey online, by visiting the website URL provided below. All responses are confidential; they will be combined with all of the other responses for statistical analysis, and reported only in aggregate.

Please feel free to forward this email to anyone in your office who is a health educator (or health promotion specialist). If you do not have any health educators working out of your office, I would really appreciate it if you let me know. Thank you so much for your time!

Link to the online survey: [deleted]

### Vita

Karen Jean McClanahan, more often known as “Kitty,” was born in Burbank, California. She holds a Bachelor of Arts in Economics from California State University, Northridge, and a Master of Science in Library Science, from the University of Kentucky. Prior to her graduate studies, her first career was in market research, primarily for television and motion pictures. She graduated with a Ph.D. in Communication and Information, in May of 2011, Her doctoral studies at the University of Tennessee focused on health information and communication, with a cognate in Public Health. Her research interests, in addition to the information behavior of health educators and public health professionals in general, include the development of the electronic universal health record, and health campaigns for behavior change.