Evidence-Based Practice for Public Health Project: Final Report

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Background

There are numerous clinically based models for finding the "best evidence" for the diagnosis and treatment of disease. This process is called evidence-based medicine or EBM, which has been defined as "the conscientious, explicit, and judicious use of current best evidence in making decisions about the care of individual patients. The practice of evidence-based medicine means integrating individual clinical expertise with the best available external clinical evidence from systematic research".[1] The need for improved access to high quality public health information has been echoed in various forums involving public health professionals, librarians, and information specialists since the mid 1990s.[2-6] The information needs of the public health workforce have become all the more urgent with the increasing frequency of emergence of new infectious diseases such as severe acute respiratory syndrome (SARS) and avian influenza, as well as the increasing concern about acts of bioterrorism, such as spreading anthrax spores via the US Postal Service in 2001.

A major difficulty in meeting these needs is the great breadth of the public health discipline that makes it difficult to identify and collect a body of evidence-based literature to address the growing multitude of specific public health information needs. The public health workforce may be more diverse than any other group of health professionals[7] and includes professionals trained in dozens of disciplines,[4, 6] ranging from environmental health to veterinary medicine, from sanitary engineering to epidemiology.

Access to evidence-based public health information has become a growing concern for medical librarians. In 1997, the National Library of Medicine (NLM) along with the Centers for Disease Control and Prevention (CDC), the Association of State and Territorial Health Officials (ASTHO), the National Association of County and City Health Officials (NACCHO), and other public health organizations formed the Partners in Information Access for the Public Health Workforce.[8] The mission of Partners is to help the public health workforce find and use information effectively to improve and protect the public's health. The Evidence-Based Practice for Public Health Project at the Lamar Soutter Library, University of Massachusetts Medical School, was initiated in 2001. At the start of this project there was little attention paid to "best practices" for population-based public health. The overall purpose of this project was to address the need for access to quality evidence-based public health information.

In an effort to improve access to resources for evidence-based public health practice, the project has identified the knowledge domains of public health, public health journals and bibliographic databases, and evidence-based resources for public health practice. The project compared existing resources for locating, summarizing, synthesizing, and disseminating evidence-based information available to clinical medical practitioners with resources available to public health practitioners. We found that there were many more types of resources focused on clinical medical practice than on public health practice. The clinical medical resources were based on several different models of information search, summary, synthesis, and delivery, and some of most promising models had little or no presence in the public health arena. To explore and address this gap, the project sought to examine and classify the features of the clinical evidence-based medicine models, to assess their potential for improving access to evidence-based public health information, and to develop new models that could effectively address the unique needs of public health professionals.

The project team undertook a qualitative study to determine the information needs of public health practitioners and to develop strategies to improve access to credible and relevant information. The study combined three objectives that previous investigators had generally pursued individually: (1) the characterization of information needs of public health practitioners, (2) the assessment of barriers to information access, and (3) the identification of typical information seeking behaviors. We have used the insights gained from the study to inform the construction of an extended classification of the types of information needed by public health professionals and of an information system model that could meet their needs for access to diverse credible sources.

Original Research Plan Objectives

Objective 1: To identify at least three models of evidence-based literature approaches to clinical medicine and review their applicability to the literature of public health.
>   In order to determine the applicability of clinical evidence-based models to the literature of public health, this objective was expanded and revised to include the following: (1) to identify top public health journals by impact factor, (2) to create a list of public health journals and determine if they are available in print or in electronic form, and (3) to compile a list of public health bibliographic databases.

Objective 2: To identify any existing preliminary models or products for assessing the quality of public health literature.

Objective 3: To evaluate the models/products for effectiveness; identify their pros and cons, strengths and weaknesses; scalability; usefulness.

Objective 4: To identify a narrow subject area and pilot test it within the models (products) identified for applicability with public health.
>   In order to identify a narrow subject area within the field of public health, this objective was revised and expanded to identify the major areas of public health and to outline the knowledge domains of public health.

Objective 5: To develop a set of "filters" for retrieving high levels of evidence with the published public health literature.
>   This objective as originally stated has been met by the Healthy People 2010 Information Access Project.[9] This project, a collaboration of the National Library of Medicine and the Public Heath Foundation, has developed pre-formulated search strategies in PubMed[10] for selected Healthy People 2010 focus areas.[11] The original objective was modified to: *To develop a "Hints for Searching" section on the project's website. This section will include NLM Medical Subject Headings (MeSH) for retrieving published public health literature.*

Objective 6: To develop a set of "lessons learned" and recommendations for developing a "preferred" model (database, electronic publication and website).

Objective 7: *To design an outreach and training program to increase the awareness of "evidence-based practices" in public health and encourage the use of the web products developed as a result of this study among public health practitioners.*

Progress toward Objectives

We successfully achieved *Objectives 1, 2, 3, 4, 6,* and *7* of the research plan. A description of achievements and significant findings follow. With respect to *Objective 5*, we were invited to work with librarians at the National Library of Medicine to develop public health search filters for PubMed to retrieve published public health literature and to continue to serve as advisors to this NLM project.

Methods Utilized to Meet Objectives

Identification of Clinical Evidence-Based Resources for Clinical Practice

We identified existing evidence-based information resources available to clinical practitioners that were advertised via mailings, email promotions, and vendor displays at academic meetings. Additional clinical resources were identified in discussions with medical professionals who were intensive consumers of medical information. We also performed informal Internet searches using Google to identify additional clinical information resources. The identification of existing clinical evidence-based information resources meets *Objective 1* of the research plan.

Identification of Evidence-Based Resources for Public Health Practice

We identified existing evidence-based information resources for public health practice. Sources used to identify public health resources included links from the Cochrane Health Promotion and Public Health Field website,[12] other public health Internet sites, online Google searches, and recommendations from project consultants. We reviewed and summarized each resource, provided online access information, and created a page on the project's website, *Evidence-Based Resources for Public Health Practice Available for Free Online Access*, at http://library.umassmed.edu/ebpph/ebresources.cfm. We organized each resource by type: (1) evidence-based guidelines, (2) systematic reviews, (3) pre-formulated and filtered searches of published research studies, and (4) best practices. We updated the webpage on a regular basis when new information became available or access information changed. The identification of existing information for public health practices meets *Objective 2* of the research plan.

Organization and Evaluation of Evidence-Based Clinical and Public Health Information Resource Models

We prepared an evaluative chart to characterize the identified existing information resources available to medical and public health professionals. The resources were categorized into four main groups of information resource models for clinical and public health practice. The first group, *Reports of Original Research*, includes examples of original research studies published in journals, government reports, and books; bibliographic

databases of citations to original studies; and filtered searches of bibliographic databases. The second group, *Summaries, Critiques and Commentaries*, includes examples of summaries and critiques of original studies and expert commentary and recommendations based on original studies. The third group, *Systematic Reviews, Meta-Analyses and Evidence-Based Guidelines*, includes examples of systematic reviews with explicit criteria for identifying, selecting, and critically appraising studies; meta-analyses of data from original research studies; and evidence-based guidelines based on original studies. The fourth group, *Comprehensive Knowledge Bases*, includes examples of online textbooks with indices and search options; collections of multiple online resources (books, journals, and reports) with comprehensive searching across texts; and collections of multiple, carefully selected databases with integrated search options.

We determined and described particular characteristics of each identified clinical and public health information resource. Each resource was evaluated for effectiveness in synthesizing and disseminating evidence-based knowledge for practice. We identified and described key features, strengths, and weaknesses of each resource. The organization, characterization, evaluation and of evidence-based clinical and public health information resource models meets *Objective 3* of the research plan.

Identification of the Knowledge Domains of Public Health

Public health is a multidisciplinary field ranging broadly across the health care spectrum. In order to develop an evidence-based tool appropriate to public health, it was necessary to outline the field of public health and to identify the major knowledge domains of public health and information resources associated with each knowledge domain. We used sources that represented prominent public health associations, government health agencies, national health objectives, public health occupations, public health literature and library public health subject headings to identify the knowledge domains and subdomains of public health. The public health sources used were: (1) public health accreditation criteria from the Council on Education for Public Health;[13] (2) the public health reference book, *Maxcy-Rosenau-Last Public Health & Preventive Medicine*;[14] (3) collection categories from the *American Journal of Public Health*;[15] (4) *The Public Health Work Force: Enumeration 2000*, a report from the U.S. Department of Health and Human Services;[16] (5) the Massachusetts Department of Public Health,[17] (6) sections and interest groups of the American Public Health Association (APHA);[18] (7) public health objectives from *Healthy People 2010*;[11] (8) public health guidelines from *The Guide to Community Preventive Services*;[19] (9) the Essential Public Health Services developed by the Public Health Functions Working Group;[20] (10) Medical Subject Headings (MeSH) and journal subject headings from the National Library of Medicine;[21] and (11) subject headings from the Library of Congress.[22] A table of sources used to identify the knowledge domains of public health is attached (Appendix 1).

We created a chart of the public health topics, knowledge areas, book chapters, collection categories, occupational categories, government bureaus and programs, association sections and interest groups, focus areas and leading health indicators, essential services, and subject headings with information derived from the identified public health sources (Appendix 2). The chart was used to identify and organize the knowledge domains of public health. The initial knowledge domains of public health were revised after consultations with the project's expert consultants and a review of the public health journal literature. The

identification of the knowledge domains of public health relates to meeting *Objective 4* of the research plan.

Identification of the Top 25 Public Health Journals by Impact Factor

We used the Institute for Scientific Information (ISI)'s *Journal Citation Reports Science Edition*[23] *2001* and *2002* and *Social Science Edition*[24] *2001* and *2002* to rank journals in the subject category, "Public, Environmental, and Occupational Health" by impact factor. A journal's impact factor is a measure of the frequency with which the average article in a journal has been cited in a particular year. We also determined how these journals are categorized in the National Library of Medicine's *List of Journals Indexed in Index Medicus 2002* and *2003*.[25, 26] Creating a list of the top 25 public health journals by impact factor relates to meeting *Objectives 1* and *2* of the research plan.

Compilation of Public Health Journals List

The list journal titles relevant to public health was created by compiling: (1) a list of the most frequently requested journals through the Centers for Disease Control and Prevention (CDC) Information Center's Document Delivery Service; (2) the most frequently cited journals from pre-formulated search strategies of the Healthy People 2010 Information Access Project;[9] (3) journals from the Core Public Health Journal Project;[27] (4) the top 25 journals by impact factor from the Institute for Scientific Information (ISI)'s Journal Citation Reports Science and Social Science Editions (2001-2002);[23, 24] and (5) recommendations from public health subject experts.

Once the journal list was developed, journal titles were verified and organized. The journal titles were verified using the National Library of Medicine's *List of Journals Indexed in Index Medicus,*[25] OCLC (WorldCat),[28] the Serials Directory from EBSCOhost[29] *Ulrich's International Periodicals Directory*[30] or by the publisher's website. We determined an Internet address (URL) for each journal title available online. Online links were found in OCLC (WorldCat),[28] jake,[31] the Serials Directory from EBSCOhost,[29] *Ulrich's International Periodicals Directory,*[30] or by searching Google.[32] For all journals available in electronic format (online full-text), we determined if the journal was available for free or by subscription only. The following information was compiled for each journal identified: (1) source of the journal title; (2) the associated knowledge domain of public health; (3) the core public health subject category; (4) if the journal was currently indexed *Index Medicus*, (5) the *Index Medicus* subject category; and (6) online full-text availability. We also noted which journal titles were considered to be grey literature by the Core Public Health Journals project.[33]

We created online links to the public health journal titles on the project's website at http://library.umassmed.edu/ebpph/journallist.cfm, and complied a list of public journals available for free online access at http://library.umassmed.edu/ebpph/freephjournals.cfm. This list was updated on a regular basis with new public health journals and edits to journal title and online access information. Compiling a list of public health journals relates to meeting *Objectives 1* and *2* of the research plan.

Classification of Public Health Journals by Knowledge Domain of Public Health

Each journal title was matched with one or more public health knowledge domains. We reviewed subject categories from the *List of Journals Indexed in Index Medicus*,[25] from the Core Public Health Journals Project[33] and from content experts in the field of public health to determine assignment to the most appropriate public health knowledge domain(s) for each journal. Publishers' websites (i.e. aims and scopes of the journal) and tables of contents were also examined for each of the journals and used for domain assignments. We compiled a list of public health journals classified by knowledge domain and subdomain of public health and specified if a journal was available in electronic format. We created a drop-down menu on the project's website so that users can view public health journals by associated knowledge domains. Classifying the list of public health journals by knowledge domain of public health relates to meeting *Objectives 1*, *2*, and *4* of the research plan.

Compilation of Public Health Bibliographic Databases List

We created a list of public health bibliographic databases by compiling databases listed on public health information websites, recommendations from public health librarians and subject experts, consensus from reference librarians at the CDC Information Center of bibliographic databases used for mediated searches, published literature on public health information, and publications that index or abstract articles from the *American Journal of Public Health*[34] the *Annual Review of Public Health*,[35] and the *American Journal of Epidemiology*.[36] A complete list of sources used to compile the list of public health bibliographic databases is attached (Appendix 3).

The selection criteria used to compile the list of public health bibliographic databases (both in print or electronic form) were databases that provide descriptive information (title, author, and source) for print or electronic materials related to public health. The materials indexed include journal articles, books, book chapters, book reviews, systematic reviews, guidelines, dissertations, trade magazine articles, research reports, newspaper articles, conference papers and proceedings, commentaries, government documents, brochures and pamphlets, information packages, fact sheets, manuals, policy and legal documents, editorials, letters, videos, and images.

For each database, we provided a brief description and online access information. We updated the list of databases on a continual basis and posted the list of public health bibliographic databases with online links to the project's website at http://library.umassmed.edu/ebpph/dblist.cfm. We compiled a separate listing of databases available for free online access at http://library.umassmed.edu/ebpph/freephdbs.cfm. Compiling a list of public health bibliographic databases relates to meeting *Objectives 1* and *2* of the research plan.

Creation of Project Website

We worked with the Robert Vander Hart, the Electronic Resources Librarian at the Lamar Soutter Library, University of Massachusetts Medical School, to create a website to describe the project's objectives and to provide online access to relevant findings and resources for evidence-based public health practice. We updated the website, http://library.umassmed.edu/ebpph, on a regular basis when new information, resources,

findings, and presentations became available. The creation of a project website relates to meeting *Objectives 5, 6,* and *7* of the research plan.

Development of Continuing Education Course on Evidence-Based Public Health

We worked with Kristine Alpi, Associate Library Director of the Samuel J. Wood Library and the C.V. Starr Biomedical Information Center, Weill Cornell Medical College (formerly the Library Manager of the Public Health Library at the New York City Department of Health and Mental Hygiene); and Nancy Allee, Director of Public Health Information Services and Access at the University of Michigan to develop a Medical Library Association (MLA) continuing education (CE) course, *Evidence-Based Public Health: Finding and Appraising Relevant Resources*. Hathy Simpson, Project Coordinator was a co-instructor of the class and presented material based on the findings of this project.

The course was approved for 8 MLA CE contact hours of continuing educational activity. The course was promoted in the MLA Annual Meeting 2004 program (Appendix 4). Ms. Alpi and Ms. Allee traveled to the Lamar Soutter Library, University of Massachusetts Medical School, in March 2004 to teach a practice class with Ms. Simpson to librarians and public health faculty at the University of Massachusetts Medical School. Thirteen people attended the practice class. We received feedback and suggestions on improvements to incorporate into the course presentations and manual.

A set of preliminary questions were sent to the course participants to acquire some background information about them so that we could target the course to meet their needs. We compiled the answers to these questions (Appendix 5) and created a summary chart of their bibliographic database searching experience (Appendix 6).

The class was organized into three main sections: (1) *Characteristics of Evidence-Based Public Health* and *Resources Available for Evidence-Based Health Practice*, was created and taught by Hathy Simpson; (2) *Tools and Resources for Collection Management of Public Health Materials*, was taught by Nancy Allee; and (3) *Evidence-Based Critical Appraisal* and *Public Health Database Searching*, was taught by Kristine Alpi. We developed PowerPoint presentations and compiled a class manual organized into a 3-ring binder for course participants.

We developed a webpage for the class, http://library.umassmed.edu/ebpph/mlaclass.cfm, to demonstrate evidence-based resources and for the participants to use during the hands-on portion of the class. All course materials and presentations were posted to this webpage.

The class was held at the MLA Annual Meeting on May 21, 2004 in Washington, DC. All course participants filled out an MLA CE course evaluation form. Development and teaching of the continuing education course meets *Objective 7* of the research plan.

The course has been renewed for CE credit by MLA for one year and can be offered as a full-day or half-day course in the future.

Qualitative Study to Determine Public Health Information Needs

Interviews of Public Health Professionals, Bureau of Communicable Disease Control, Massachusetts Department of Public Health

We developed a key informant interview script to collect data on the information accessing behaviors, needs, and barriers to information access of public health professionals working in the domain of communicable disease control in a state health department. The interview script included questions about the types of work tasks public health professionals performed that required access to information, currently used and preferred information sources, preferred formats for research information, current barriers to information access, and desired enhancements for information access (Appendix 7).

Dr. Nancy La Pelle, the project's Qualitative Research Consultant, interviewed public health professionals from the Massachusetts Department of Public Health (MDPH) in the Bureau of Communicable Disease Control (BCDC). The Director of the Bureau provided us with names of individuals who most often needed access to information from multiple sources. Twelve interviewees were selected by the BCDC Director from the program areas of tuberculosis prevention and control; epidemiology and immunization; sexually transmitted disease (STD) prevention and control; refugee and immigrant health; and library services. We sent a letter to the participants explaining the project and scheduled interviews. Individual interviews with BCDC informants took place in the fall of 2003. Conducting interviews and focus groups with public health professionals to determine their information needs relates to meeting *Objectives 3* and *4* of the research plan.

The research protocol used for this study was approved by the Committee for the Protection of Human Subjects in Research at the University of Massachusetts Medical School, IRB Docket #H-10507. Copies of Institutional Review Board (IRB) approval for each year were sent to the Association of Teachers of Preventive Medicine (ATPM) and the CDC.

Conduction of Focus Group, Bureau of Communicable Disease Control, Massachusetts Department of Public Health

We conducted a follow-on focus group with seven participants previously interviewed from the Bureau of Communicable Disease Control, MDPH, in the spring of 2004. We introduced the project and its goals and provided a handout for the focus group that provided information about the project and potential benefits to project participants (Appendix 8). The agenda of the focus group included a review of the findings from the informant interviews for validation followed by a presentation on several existing examples of information organization and dissemination models in order to ascertain the participants' familiarity and preference for specific features of these models (Appendix 9).

Interviews of Public Health Professionals, Division of Community Health Promotion, Massachusetts Department of Public Health

Based on the inconclusive findings from interviews with the BCDC participants, we modified the key informant interview script for public health professionals working in another domain of public health, community health promotion. The revised script had more

specific questions about listservs providing links to current information, systematic reviews, and comprehensive knowledge bases (Appendix 10).

Seven participants from the Division of Community Health Promotion (CHP), Bureau of Family and Community Health, MDPH were selected by their Director in the areas of cancer, diabetes, and cardiovascular disease prevention and control; nutrition and physical activity; and women's, men's and elder health. Dr. La Pelle conducted the individual interviews by telephone with CHP professionals in the summer and fall of 2004.

Conduction of Focus Group, Division of Community Health Promotion, Massachusetts Department of Public Health

The project team conducted a follow-on focus group with three CHP participants previously interviewed in the early spring of 2005. The focus group agenda for CHP included introducing the project, reviewing a comparison of findings from the BCDC and CHP groups, validation of CHP findings, and a presentation of existing information accessing model examples (Appendix 11). We asked the group specific questions about the desirability of specific resource features and presented a hypothetical model of information reformulation, organization, and access based on our interpretations of CHP informants' responses to the interview questions and prior findings from the BCDC informants (Appendix 12). Additional questions were asked about the use of PubMed as a foundation for implementing the model and how PubMed would need to be enhanced to evolve into an implementation of the hypothetical model.

Analyzing Data and Validating Coding

All individual and group interviews were audiotaped and transcribed for analysis. Our thematic analysis approach rests heavily on the qualitative research techniques described by Crabtree and Miller,[37] Miles and Huberman,[38] and Patton.[39] Transcribed textual data from interviews were reviewed through a continuous process of comparing data segments to other data segments, looking for similarities, differences, and themes. A codebook was developed defining themes identified in the script as well as subthemes that emerged from the data. The transcripts were coded thematically, and, based on a technique developed by LaPelle,[40] we employed Microsoft Word to create tables of text responses where sorting of text segments can be done based on theme codes. After sorting, coding validity was assured by reviewing the text that sorted into each code, correcting those that were miscoded and resorting. Within-transcript analyses were done, proceeding to cross-transcript analyses. A comparison table was constructed to compare summarized responses related to each significant theme across participants for each group. Subsequently findings were compared across groups.

Achievements and Significant Findings

Identified Information Resources for Evidence-Based Clinical and Public Health Practice

We identified 30 examples of existing clinical and public health evidence-based information resources. For each resource we identified: (1) Internet address, (2) topics covered, (3) format and access information (*e.g.* "available online by subscription only"), (4) producers and collaborators, (5) inputs (*e.g.* "systematic review of the literature"), (6) outputs

(*e.g.* "structured abstract with expert commentary"), (7) search options, (8) updating, and (9) issues (pros, cons, and feasibility).

We created a separate list of evidence-based resources for public health practice with access and descriptive summaries of each resource (Appendix 13) and a handout of evidence-based resources for public health practice that we have provided to public health practitioners, students and health science librarians (Appendix 14). We created a page on the project's website for online access to the identified evidence-based resources for public health practice, http://library.umassmed.edu/ebpph/ebresources.cfm (Appendix 15).

Characterization and Evaluation of Existing Evidence-Based Clinical and Public Health Information Resource Models

The identified examples of clinical and public health resources were organized into an evaluative chart, *Models of Information Summary, Synthesis, and Dissemination: Sources and Organization of Evidence-Based Knowledge*. The evaluative chart is attached (Appendix 16) and is also accessible on the project's website at http://library.umassmed.edu/ebpph/models.pdf. The chart classifies and describes key features of the identified evidence-based information resources for clinical and public health practice. Of the 30 information resources, nine were classified as examples of reports of original research; six were classified as examples of summaries, critiques and commentaries; twelve were classified as examples of systematic reviews, meta-analyses and evidence-based guidelines; and three were classified as examples of comprehensive knowledge bases. Characteristics and features of the each of the identified information resources are presented on the chart.

Key features of the identified information resources were: (1) keywords for searching large collections of research reports and reviews; (2) pre-formulated search filters; (3) automatic notification (email alert services); (4) abstracts, summaries, and expert commentaries; (5) systematic reviews; (6) evidence-based guidelines; (7) comprehensive knowledge sources; (8) within article indexing with links that allows access to the specific information needed; (9) archiving of information; (10) free online access; and (11) evidence-based methodology. These features with examples of information resources are presented in Appendix 17.

Identified weaknesses of the information resources were: (1) access by paid subscription only; (2) no updating of information; (3) lag time between original research publication and dissemination; (4) too many results (information overload); (5) no ability to navigate through the resource; (6) no access to full-text journal articles or documents; (7) weak or no search capabilities; (8) limited in scope; broken links or errors; (9) lengthy reports with no summary; and (10) absence of evidence-based methodology.

Identified Knowledge Domains of Public Health

We identified twenty major knowledge domains and 155 subdomains of public health representing multiple subjects of knowledge within the broad field of public health. The identified knowledge domains and subdomains are attached (Appendix 18). The knowledge domains of public health can be used to classify public health information resources including the development of topic pages for the Partners in Information Access for the Public Health Workforce Website, http://PHPartners.org.

Top 25 Public Health Journals by Impact Factor

The lists of the top 25 public health journals by impact factor 2001 and 2002 are attached (Appendices 19 and 20). Online access to the top 25 public health journals is available from the project's website at http://library.umassmed.edu/ebpph/top25.pdf. The journals are listed in order of impact factor and include the journal's name, impact factor, and Index Medicus category.

List of Public Health Journals

We identified 697 public health journal titles and compiled a table listing the journals in alphabetical order (Appendix 21). The table includes: (1) journal title, (2) source used to identify the journal, (3) associated public health knowledge domain(s), (4) core public health subject category, (5) indexed in *Index Medicus* (MEDLINE), (6) *Index Medicus* subject category, and (7) online access availability. Online links to public health journals titles are available on the project's website at http://library.umassmed.edu/ebpph/journallist.cfm. We identified 94 public health journals available for free online access and provided online access to these journals at http://library.umassmed.edu/ebpph/freephjournals.cfm (Appendix 22). The list of public health journals includes many journal titles that are not indexed in MEDLINE, but that are indexed in other bibliographic databases including EBSCO,[41] CINAHL,[42] and PsycINFO.[43]

Public Health Journals Classified by the Knowledge Domains of Public Health

The list of public health journals classified by knowledge domain and subdomain of public health is attached (Appendix 23). Public health journals that are available electronically are designated by a 📖 symbol. Journal titles can be browsed for alphabetically or by knowledge domain of public health on the project's website, http://library.umassmed.edu/ebpph/journallist.cfm (Appendix 24).

List of Public Health Bibliographic Databases

We compiled a list of 189 bibliographic databases that provide citations to publications related to the field public health (Appendix 25) and provided online access to the databases on the project's website at http://library.umassmed.edu/ebpph/dblist.cfm. For each database, we provided source information, a brief description, and Internet addresses for databases available for free online access. We identified 79 public health bibliographic databases available for free online access and provided access to these at http://library.umassmed.edu/ebpph/freephdbs.cfm (Appendix 26).

Project Website, http://library.umass.edu/ebpph

The project's website, http://library.umass.edu/ebpph, describes the project and its objectives; cites ATPM/CDC support; presents up-to-date findings of the project; lists the project's personnel; and provides online access to public health journals, databases, evidence-based resources, quarterly reports, and presentations (Appendix 27). Information available on the project's website:

- Overview of project
- Funding
- Project Objective
- The Knowledge Domains of Public Health

- Public Health Journals
- Public Health Bibliographic Databases
- Evidence-Based Resources
- Continuing Education Course
- Presentations
- Quarterly Reports
- Links to Related Projects
- Project Personnel
- Contact Information

The project's website has received attention from the national and international public health community. We received requests for information from the Department of Public Health at the Indiana University School of Medicine; the Mental Health Association of Rockland County, NY; the Association of Schools of Public Health, Washington, DC; the Department of Health, New York State; the Madison County Health Department, Richmond, KY; the New Hampshire Institute for Health Policy and Practice, Durham, NH; the Institute for Public Health at the University of New Mexico; the Cochrane Health Promotion and Public Health Field, Australia; and the Chinese Cochrane Center.

The project's website has been linked from many national and international websites related to evidence-based practice and public health including the School of Health and Related Research, UK; the Australian Resource Centre for Healthcare Innovations; the Clinical Information Access Online, Australia; the Social Science Information Gateway, UK; the Evidence-based Medicine Resource Center at the New York Academy of Medicine; the Health Sciences Library at Lutheran Medical Center, Brooklyn, NY; Indiana's Public Health Information Network; the Alberta Heritage Foundation for Medical Research, Canada; the University of Nottingham Greenfield Medical Library, UK; Iowa Public Health Information; Intellectual Disability and Allied Libraries, Ireland; the Digital Libraries Network, UK; the Association of Maternal and Child Health Programs, Washington, DC; the EurasiaHealth Knowledge Network, American International Health Alliance, Washington, DC; Evidence Based Public Health Nursing, University of Illinois at Chicago; Indiana's Public Health Information Network; Minnesota Department of Public Health; the National Network of Libraries of Medicine New England Region; and the Partners in Information Access for the Public Health Workforce Tutorial, *Public Health Information and Data Tutorial*, http://phpartners.org/tutorial/index.html. See Appendix 28 for a list of websites that link to the project's website.

The project's website has had over 60,000 visitor sessions from May 2003 to October 2005. A usage statistics chart for the project's website is attached (Appendix 29).

Continuing Education Course on Evidence-Based Public Health

Hathy Simpson, Kristine Alpi, and Nancy Allee developed and taught an MLA CE course: *Evidence-Based Public Health: Finding and Appraising Relevant Resources*. We developed PowerPoint presentations (Appendices 30-32), developed a class webpage (http://library.umassmed.edu/ebpph/mlaclass.cfm), and compiled a class manual (Appendix 33) organized into a 3-ring binder for course participants with the following material:
- Course Information
- Agenda
- Characteristics of Evidence-Based Public Health

- Resources Available for Evidence-Based Health Practice
- Knowledge Domains of Public Health
- Public Health Journals and Associated Knowledge Domains
- Public Health Journals Available for Free Electronic Access
- Top 25 Public Health Journals by Impact Factor
- Public Health Bibliographic Databases
- Tools and Resources for Collection Management of Public Health Materials
- Evidence-Based Public Health Database Searching
- Critical Appraisal Background and Practice
- Searching and Appraisal Case Study Exercises
- Bibliography of articles and books used to develop the course
- Sample Collection Manual from the University of Michigan Public Health Informatics Services and Access
- Grey Literature Producing Organizations
- Copy of the class webpage

The class was held at the MLA Annual Meeting on May 21, 2004 in a computer classroom with Internet connection at the Himmelfarb Health Sciences Library, George Washington University Medical Center, Washington, DC. Reviews of the course by participants were excellent. A summary chart of the course evaluations is attached (Appendix 34). The course participants emphasized that the take-home manual was a valuable resource and that there was very good coordination between the manual and the PowerPoint presentations.

Hathy Simpson was invited to be a guest lecturer at a class for Masters of Public Health (MPH) candidates at the University of Connecticut Health Center. She presented a revised version of the CE course to the MPH students in June 2004 (Appendix 35).

Results of Qualitative Study

Preliminary Results of Key Informant Interviews

Dr. La Pelle interviewed twelve public health professionals at the Bureau of Communicable Disease Control (BCDC) and seven public health professionals at the Division of Community Health Promotion, Bureau of Family and Community Health (CHP), MDPH, to determine their information needs and preferences. The public health professionals interviewed performed a variety of work-related tasks that require information access. Summaries of the BCDC and CHP interview data of the current types of information resources used by the informants and enhancements that they desired are attached (Appendices 36-38).

Final Results of Interviews and Focus Groups

Work context

Professionals at MDPH have a wide variety of needs for information and varied significantly in their level of skill in accessing it. All MDPH staff interviewed had desktop computers and access to the Internet. MDPH itself hosts a multi-faceted website that provides access to programmatic information, statistical databases and MDPH documents both to employees and to the general public. The main MDPH offices are located in multiple sites in

the Boston area. The CHP group and the BCDC are located in different office buildings, each of which includes a small library staffed by part-time librarians offering document search and retrieval services. However, the urgency of information needs differed widely across programs, and use of external electronic information sources also differed widely due to variation in both need and skills.

Tasks requiring external information access

The nature of the work of the two groups also differs. BCDC is concerned with both established and emerging communicable diseases and needs fast-breaking news about emerging diseases such as SARS as well as evidence-based information about more established diseases like tuberculosis. CHP deals primarily with health promotion related to chronic diseases and is involved in working with external coalitions to develop statewide collaborative prevention and control plans for diseases such as cancer, cardiovascular disease and diabetes. However, there is also significant overlap in the information accessing needs of these two groups.

Categories of Information

Six distinct categories of information emerged from the participants' statements about the kinds of information they required in their work: (1) early reports on newly identified health risks and preventive behaviors; (2) early reports on emerging practices and programs, usually descriptive in nature; (3) information on evaluated new interventions known to be effective; (4) syntheses of knowledge on established public health threats and practices as typically found in reference texts; (5) published research reports, including meta-analyses and systematic reviews as found in peer-reviewed journals, often based on formal research designs; and (6) evidence-based guidelines. Examples of the kind of information currently accessed by the participants in each of these six categories and typical associated sources of information can be found in Appendix 39.

The six categories can be arrayed along a continuum based on the amount of available research evidence supporting each of the categories (Appendix 40). We separated category Five into two categories: published research reports and meta-analyses/systematic reviews to emphasize the difference between these two resources. The resulting seven-category continuum ranges from limited research support for early descriptions of emerging health threats and new interventions on the lower end of the continuum, through increasing amounts and quality of evidence for the types of information farther along the continuum.

Information Sources and Access

The informants reported a variety of sources of information in all seven categories and a number of different means for obtaining it. The sources included websites, journals, presentations at meetings, personal communications, and electronic automatic notifications that provide summaries of news and journal articles and links to available sources. Website-specific and general search engines were commonly used to seek out the most relevant information. Email was a key means for receiving automatic notification and exchanging a variety of types of information. The telephone and attendance at conferences provided other important means of accessing information, especially on emerging health threats and new public health practices.

Limitations of existing mechanisms of information access

We found that there were significant limitations on the available means of information access identified by participants that could be met by improving electronic access mechanisms. Stating that there were too many relevant websites to search them all effectively or regularly, both groups wanted one portal access to all categories of information via a good search engine. To address delays in becoming aware of important new information, they also wanted automatic notification of newly available information in areas specific to individual interests. They felt websites and automatic notification systems such as listservs were complimentary. Participants in both groups reported feeling bombarded with unfiltered, often duplicative information in emails and from participation in listservs with no way to screen out irrelevant information. They reported similar difficulties dealing with irrelevant and duplicative returns from searching websites because public health-specific keywords are not standardized or used effectively by search engines. Both groups expressed a need for better mechanisms for selecting and filtering information sought from listservs and via search engines.

Both groups noted limitations on access to information in selected public health sub-domains of interest. BCDC professionals noted information gaps in the areas of STDs and refugee and immigrant health. CHP professionals cited limitations on information in areas such as environmental links to cancer, elder health; legislative and policy change; and newly identified health risks and healthy behaviors. CHP and BCDC informants identified problems in accessing relevant information from related domains outside of traditional public health domains such as in the literatures of marketing, human resources management, organizational behavior, operations management, and others. They would like to be able to formulate searches that could access a broad range of databases to find evidence related to: (1) return on investment for worksites implementing health programs; (2) programs that have been developed in worksites related to communicable or chronic disease prevention; (3) effective educational strategies to reach employees in worksites; (4) effective interventions to motivate, men, women, elders and other specific population groups to take care of their health; (5) effective quality improvement projects in healthcare organizations; and (6) best practices related to communicable diseases in emergency rooms. They also identified limitations on access to grey literature as well as systematic reviews and full-text of journal articles. Informants stated that not many extensive sources exist for systematic reviews and summary information of interest to public health; however, a few participants were not aware of those that do exist, *e.g.*, the Guide to Community Preventive Services.[19]

Many also expressed difficulty keeping track of information they wanted to save for future access and wanted better mechanisms to archive information accessed earlier in a way that could facilitate easy retrieval. Informants also expressed needs for training in electronic accessing skills and the availability of human-mediated searching via article retrieval services.

Participants identified several limitations in information access and in some cases suggested means for overcoming those limitations. The limitations could be classified in three broad categories: (1) limitations affecting timely and convenient delivery of information including limited access to electronic full text of journals, (2) limitations in access to all categories of information in some content areas (i.e., disciplines outside traditional public health) and in the grey literature, and (3) limitations in locating information that is available, including problems with search terms and in organizing archives.

Participants did not specifically identify as a problem the very limited availability of summaries, commentaries, and critiques of public health studies, even after we had presented to them examples of these resources from both public health and clinical medicine. We hypothesize that one reason informants did not report this limitation is that they have had little or no experience working with these types of resources. It is possible that as more summaries, commentaries and critiques become available to public health practitioners that their desire for more of these resources may increase. The recently developed Health-Evidence.ca website[44] provides an online registry of systematic reviews of public health interventions. This project, funded by the Canadian Institutes of Health Research and conducted by Dr. Maureen Dobbins, searches for systematic reviews in a variety of databases of published literature.

Hypothetical Model

In response to the information content, format, and access concerns raised by informants, we developed a hypothetical model system grounded in findings from our data analysis (See Appendix 12). The model includes user-selected filters and pre-formulated search criteria for tailoring information sought via both automatic notification systems and search engines; an automatic notification mechanism that would send information to users that has been filtered according to the user's filtering requests; a scanning and reviewing system to locate and critique/review newly published information relevant to public health professionals, and a customized archiving database of credible information accessed by system users.

In early 2005 when we presented this model to the CHP participants, the component at the top right said simply "newly published public health information." We initially presented the model as an approach to accessing and delivering information that appeared in PubMed. Respondents stated that to be very useful the model would have to facilitate access to information from other sources and disciplines not represented in PubMed and should also reference descriptions of best public health practices and other information often found in the grey literature. In response to this concern, we added the phrase "in diverse disciplines of interest" to the model component on sources of information. A revised hypothetical model is attached (Appendix 41). Respondents liked the idea that information would be reviewed before it was disseminated and they expressed a desire to receive a narrative critique of the information from the reviewers and not just numerical ratings expressing the reviewers' findings.

Other information accessing needs identified fell primarily into the category of grey literature and statistical data. These included the ability to search conference websites via a single portal for cutting edge information and expert contact information; access via keyword search to information the CDC has on programs being implemented in other states; easy access to news articles about what is happening statewide related to health programs in schools and other venues; and a database "mecca" for surveillance data.

Significance of Findings

Identification and Provision of Online Access to Public Health Evidence-Based Resources, Knowledge Domains, Journals, and Bibliographic Databases

The project website, http://library.umassmed.edu/ebpph, is a portal to accessing quality public health information resources. It is an excellent place for a faculty member, researcher, student, or public health professional to go in order to find the best information to solve public health problems. The website is a unique online resource that provides access to a variety of resources by aggregating these resources under one umbrella. The website provides easy and convenient access to evidence-based public health resources and fills a knowledge gap that once existed in the provision of public health information resources. For these reasons, online access to the project's findings and resources via the website is important and significant and will continue to be utilized by the public health community.

Public Health is a multidisciplinary field ranging broadly across the health care spectrum. In order to develop an evidence-based tool appropriate to public health, it was necessary to identify the knowledge domains of public health and the public health literature and bibliographic databases associated with each domain. These tasks were not part of the original research plan but were necessary to undertake in order to develop a design for an evidence-based tool appropriate for public health practitioners. This endeavor is significant because it presents an approach towards defining the field of public health that others may find useful.

There is discrepancy amongst public health experts, associations, accrediting bodies, etc. as to what the knowledge domains of public health should be. Coming to consensus amongst project advisors and constituents was a complex and important task. There are various ways to define "evidence" in public health. Public health evidence may include information from expert opinion, journal literature, books, government and foundation reports, conference proceedings, public health organization newsletters, listservs, and Internet sources. The identified knowledge domains of public health can be used to organize and classify these types of public health information resources. For example, the National Library of Medicine will be using these knowledge domains as the basis for developing topical web pages for their own website, PHPartners.org. These knowledge domains are significant because other database producers or publishers can use them to organize resources in the field of public health.

Another significant impact of this project is that project staff have become recognized as experts on the topic of evidence-based public health and have been invited to speak at regional and national health science librarians' conferences. Both the Principal Investigator and the Project Coordinator have served as experts advisors to the National Library of Medicine in their outreach efforts to provide public health information to NLM's PHPartners.org project. Our project has raised awareness nationally and internationally about the importance of finding evidence-based public health resources and making them available in a fast, easy, and convenient way to the public health workforce. It can be used by faculty to foster the education of public health students.

One measure of significance of the project is the number of times the project is cited by others. The project has sparked interest from within the United States and from areas around the world including Canada, Australia, Israel, and China. The project's website has been linked to many websites related to evidence-based practice and public health (Appendix

28). The project's findings and online resources have been cited in articles published in the peer-reviewed journals and government public health reports:

- Alpi KM. Expert searching in public health. *J Med Libr Assoc*. Jan 2005;93(1):97-103.
- Banks MA, Cogdill KW, Selden CR, Cahn MA. Complementary competencies: public health and health sciences librarianship. *J Med Libr Assoc*. Jul 2005;93(3):338-347.
- Howes F, Doyle J, Jackson N, Waters E. Evidence-based public health: The importance of finding 'difficult to locate' public health and health promotion intervention studies for systematic reviews. *J Public Health*. Mar 2004;26(1):101-104.
- McGuire WL. Beyond EBM: new directions for evidence-based public health. *Perspect Biol Med*. Autumn 2005;48(4):557-569.
- Walker D, Keon W, Laupacis A, et al. For the Public's Health: A Plan of Action: Ontario Expert Panel on SARS and Infectious Disease Control; April 2004.

The project's list of public health journals has been listed as a resource for searching for evidence by the Cochrane Health Promotion and Pubic Health Field in their publication, *Guidelines for Systematic Reviews of Health Promotion and Public Health Interventions*.[45] The Senior Training and Support Officer from the Cochrane Health Promotion and Public Health Field believes that the project's list of public health journals is invaluable for helping reviewers determine which journals may be useful for hand-searching to find evidence-based public health information. The project's findings and online resources are part of the online tutorial, *Public Health Information and Data Tutorial,* http://phpartners.org/tutorial/index.html, produced in collaboration with the Partners in Information Access for the Public Health Workforce.

Results of Public Health Information Needs Study

The results of our qualitative study indicate that many critical information needs of public health practitioners are not being met efficiently or at all. The participants from MDPH confirmed many of the findings of others who have investigated public health information needs[6, 7, 46] including the need for access to a wide variety of types of information from a number of different disciplines and the need for improved means to effectively and efficiently identify the information most relevant to specific problems. We believe that our study also adds detail, depth, and updating to preexisting characterizations of public health information needs in several areas: (1) categories of information needed, (2) typical present-day sources of information and common means of accessing information, and (3) perceived limitations of access and proposals for overcoming those limitations.

Public health practitioners, like clinicians practicing medicine, are regularly confronted with new problems and complex tasks that require a timely response, often before researchers can complete studies to offer guidance. Our study confirms the findings of others that public health practitioners need access to information at all levels of research support. The Evidence-Based Practice for Public Health Project is a significant step in filling that need. However, more needs to be done.

Strategies to Improve Access to Credible and Relevant Information

The study informants offered a number of potential approaches for overcoming the limitations they identified in timely delivery, access, and location of information. They stated a preference for overcoming these limitations via enhancements made to sources and means of information access they were already using such as PubMed and listservs. A list of recommended strategies to improve access to credible and relevant information based on our study of MDPH public health professionals is attached (Appendix 42).

To overcome limitations in timely delivery of information, participants suggested that improved access to the full text of journals in electronic form would be critical. Many of the biomedical journals that publish articles relevant to public health professionals are already available in electronic versions, but the cost of offering access to these journals to dozens or hundreds of public health practitioners would be daunting for any local or state public health entity. We estimate that the cost of a subscription that included all relevant public health journals would be prohibitive. Given limitations in public health resources at every level of government, it seems unlikely that electronic access to full text journals will be soon considered a priority high enough to warrant funding unless studies show a significant return on investment.

Many informants from both groups in this study were already receiving news and automatic notification of newly published studies via listservs. Existing listservs for public health professionals typically provide information from news sources and selected titles, abstracts, and links to recently published journal articles and other documents relevant to specific disciplines. Unfortunately comprehensive listservs are available for only a few public health disciplines (*e.g.*, TB Update[47]). Our findings suggest that developing listservs that organize and deliver relevant new information for more public health disciplines may be an effective way to meet some key information needs.

A serious limitation of listservs identified by several subjects is that they tend to deliver large amounts of information in formats that make it difficult for a user to quickly seek out specific information relevant to his/her interests. We are aware of several technical means that some listserv administrators are using to deal with this problem. Items in an email can be linked to an index that appears as the first entry in the email. Links take the user to content contained in the email or on a website. Content developers for clinical medical automatic notification services are using two other techniques to help users avoid receiving irrelevant content: (1) breaking content into many subdomains and allowing users to select to receive information from specified subdomains and (2) engaging volunteer users in a process of filtering content by having them rate the quality and relevance of new information before it is delivered to all the users. Adoption of some or all of these strategies by the developers of public health listservs could effectively address some of the concerns raised in our study.

The request for access to a broader base of information from fields outside of traditional public health disciplines was driven by the need to develop effective evidence-based policies in emerging areas of public health practice such as designing environments to promote physical activity or increase pedestrian safety and developing economic justifications to encourage businesses to introduce health-related programs. CHP informants suggested that access to information from other industries, professions and disciplines would be needed including information from the realms of social marketing, advertising, sociology, engineering, human resources management, and others. Some of this information is contained in journals serving the disciplines of interest, which can be searched through

reference databases such as CINAHL,[42] EMBASE,[48] Sociological Abstracts,[49] BIOSIS,[50] PsycINFO[43] and others. Access to information in these journals by public health professionals would require establishing access to the reference databases and to print and/or electronic access to the journals themselves. In domains beyond the biomedical, it is likely many public health professionals, like those in this study, do not have skills to efficiently gather evidence or formulate searches. Either the appropriate keywords and data sources are not known to public health professionals, or concepts and keywords that are familiar to them, such as "intervention venues" or the "built environment" related to injury prevention, are not used in the other disciplines.

Even when public health professionals have ready access to a database of relevant biomedical information such as PubMed, our subjects indicated that locating useful information is hindered by the paucity of public health-oriented search terms. For example, they stated a need for search terms like "evaluated", "cost-effective", and/or "population-based interventions". Development and adoption of more standardized public health search terms could make searches more effective and also facilitate the task of filtering listserv emails. Developers of the Health-Evidence.ca website[44] have generated their own set of public health keywords related to domains of public health, population characteristics, intervention sites, intervention strategies and types of reviews (meta-analysis, narrative or systematic).

Pre-formulated search filters use combinations of existing search terms to facilitate identification of information that meet predefined criteria. In clinical medicine, a set of filters aimed at identifying publications reporting high quality, evidence-based studies have been developed, tested, and made accessible for routine use (PubMed Clinical Queries.[51] The Partners for Information Access for the Public Health Workforce project have developed dozens of filters for use in PubMed searches aimed at locating information relevant to specific Healthy People 2010 goals.[9] Wilczynski et al[52] have developed a set of search filters for PubMed[10] to enable efficient retrieval of articles relevant to healthcare quality and costs based on several criteria related to methodological rigor (appropriateness, process assessment, outcomes assessment, costs, economics, and qualitative research).[53] Although some of our respondents were familiar with some available filters, they did not appear to be using filters on a regular basis to access information.

There is clearly a need to develop and promote more and better search terms and filters for public health. We have worked with librarians at the National Library of Medicine who are working to develop public health filters for PubMed. We suggested public health journals that they could use for frequency analysis to identify medical subject headings (MeSH) and text words and phrases specifically related to public health practice. We also recommended that they review the project's identified knowledge domains of public health, to help identify relevant public health terms. Other sources for public health terminology that we recommended are the National Public Health Library Thesaurus from the National Health Service, UK,[54] and the Chronic Disease Prevention Thesaurus from the CDC.[55]

In recent years there had been an increase in the availability of all types of information on the Internet including the emergence of projects like the Partners in Information Access for the Public Health Workforce,[56] the Guide to Community Preventive Services,[19] and Health-Evidence.ca[44] that contribute to incremental improvements in public health information access, but the task is complex and enormous, and progress seems to be slow. It is our assessment that tools and resources available to clinical medical practitioners

for identifying and accessing information (*e.g.* electronic texts such as UpToDate;[57] automatic notification services such as bmj.com Email alerting service;[58] periodic, discipline-specific literature updates with summaries and commentaries such as Journal Watch[59]) are far more advanced and sophisticated than those available to public health practitioners. We believe one reason for this is that the market for information-related products for medical practitioners is large enough and lucrative enough to attract large investments in many new and creative ventures. The result is a proliferation of well-designed electronic texts, multiple sources of expert summary and critique of the literature, sophisticated and highly tailored automatic notification systems, and many other resources.

Based on our findings from this study, we believe that public health could benefit from a dual strategy for advancing information access. One strategy is the promotion of incremental improvements in existing information sources and access mechanisms, such as providing better and more public health-specific search filters for PubMed and developing more sophisticated listserv applications for disseminating automatic notifications. Initially respondents in the study seemed to favor improvements in simple tools and resources they were familiar with over new and more complex models of information access. This suggests that incremental changes may be more rapidly accepted and adopted than new and unfamiliar systems. However, the generally positive reception to our proposed information access model by the CHP informants, suggests that a well-designed new system that clearly addresses expressed needs could be well received. We suggest that organizations concerned about public health practitioners' access to information should consider sponsoring some small scale trials of some new systems for information access such as the model system we propose while at the same time continuing to foster ongoing incremental changes. Those systems that are positively received by practitioners and can show significant objective improvements in the efficiency and effectiveness of information access for a reasonable cost could then be considered for broader dissemination.

Future Plans

The Lamar Soutter Library is committed to maintaining the project website and portal access to evidence-based public health resources at the conclusion of the project. We are in the process of looking for continuation funding from other sources to continue and expand the research-related aspects of this project. We have submitted inquiries to the National Library of Medicine and to the Robert Wood Foundation.

We will be presenting the finding of this project at the American Public Health Association Annual Meeting: La Pelle, NR, Simpson EH, Luckmann R, Martin ER. *Enhancing evidence-based information access to inform public health practice*. Abstract 108127, Session 5134. Philadelphia, PA, Dec. 14, 2005. Hathy Simpson, Project Coordinator, has been invited to be a presenter with Dr. Sharon Telleen, Project Consultant, at the Association of Maternal and Child Health Programs (AMCHP) 2006 Annual Conference. They will deliver a Skills Building Session, *Identifying Evidence-Based Practices in Public Health*, March 5, 2005 in Washington, DC. Ms. Simpson has been selected to be an invited speaker at the Medical Library Association 2006 Annual Meeting for the Public Health/Health Administration Section Program "Evidence-Based Public Health Librarianship." She will present an oral paper, *Improving Access to Public Health*

Information: A Study of Information Needs in a State Health Department in May 2006 in Phoenix, Arizona.

We plan to submit the findings of the informant interviews and focus groups from the BCDC and CHP groups at MDPH for publication in the journal, *BMC Public Health*: La Pelle NR, Luckmann RL, Simpson EH, Martin ER. *Identifying Strategies to Improve Access to Credible and Relevant Information for Public Health Professionals: A Qualitative Study*. A draft of the manuscript is attached (Appendix 43).

Presentations
Appendices 44-52

Martin E, Simpson H. *Evidence-Based Practice for Public Health Project*. Oral presentation at the Lamar Soutter Library, University of Massachusetts Medical School, Worcester, MA, Sep. 19, 2002.

Martin E, Simpson H, Luckmann R. *Evidence-Based Practice for Public Health Project*. Oral presentation to the Partners in Information for the Public Health Workforce Steering Committee, National Library of Medicine, Bethesda, MD, Oct. 3, 2002.

Martin E, Simpson H, Luckmann R. *Evidence-Based Practice for Public Health Project*. Oral presentation to the Centers for Disease Control and Prevention Information Center, Atlanta, GA, Oct. 16, 2002.

Luckmann R. *Models of Information: Summary, Synthesis, and Dissemination in Clinical Medicine.* Oral presentation to the Centers for Disease Control and Prevention Information Center, Atlanta, GA, Oct. 2002.

Martin E, Simpson, H. *Evidence-Based Practice for Public Health: Finding the Answers to Public Health Questions*. Exhibit at the Lamar Soutter Library's Annual Open House, University of Massachusetts Medical School, Worcester, MA, Apr. 3, 2003.

Simpson EH, Martin ER, Luckmann R, Telleen S. *Evidence-based resources for a public health project*. Poster presentation at the Medical Library Association Annual Meeting; Abstract 56. San Diego, CA, May 4, 2003.

Telleen SL, Simpson EH. Martin ER. *Identifying evidence-based resources for Maternal and Child Health*. Poster presentation at the 131st Annual Meeting of the American Public Health Association, Abstract 4289.6. San Francisco, CA, Nov 18, 2003.

La Pelle, NR, Simpson EH, Luckmann R, Martin ER. *Improving access to credible and relevant information for public health professionals: A qualitative study of information needs in communicable disease control*. Oral presentation at the 132nd Annual Meeting of the American Public Health Association; Abstract 81772, Session 3076. Washington, DC, Nov 8, 2004.

Martin E, Simpson H, Peterson, N. *Providing Evidence-Based Public Health Resources: The Librarian's Role*. Invited plenary session panel at the North Atlantic Health Sciences Libraries Annual Meeting, Providence, RI, Sep. 27, 2005.

La Pelle, NR, Simpson EH, Luckmann R, Martin ER. *Enhancing evidence-based information access to inform public health practice*. Oral presentation at the 133rd Annual Meeting of the American Public Health Association; Abstract 108127, Session 5134. Philadelphia, PA, Dec. 14, 2005.

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Appendix 11   Focus Group PowerPoint Presentation: *Improving Access to Credible and Relevant Information for Public Health Professionals: A Qualitative Study of Information Needs in Two Domains of Public Health*. Division of Community Health Promotion, Massachusetts Department of Public Health, Mar. 23, 2005.

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Appendix 47   PowerPoint Presentation: Martin E, Simpson H, Luckmann R. *Models of Information Summary, Synthesis, and Dissemination in Clinical Medicine: Sources and Organization of Evidence-based Knowledge* . Oral presentation to the Centers for Disease Control and Prevention Information Center, Atlanta, GA, Oct. 16, 2002.

Appendix 48   Exhibit Display: Martin E, Simpson, H. *Evidence-Based Practice for Public Health: Finding the Answers to Public Health Questions*. Exhibit at the Lamar Soutter Library's Annual Open House, University of Massachusetts Medical School, Worcester, MA, Apr. 3, 2003.

Appendix 49   Poster Presentation: Simpson H, Martin ER, Luckmann R, Telleen S. *Evidence-based resources for a public health project*. Poster presentation at the Medical Library Association Annual Meeting; Abstract 56. San Diego, CA, May 4, 2003.

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Appendix 52   PowerPoint Presentation: Martin E, Simpson H, Peterson, N. *Providing Evidence-Based Public Health Resources: The Librarian's Role*. Invited plenary session panel at the North Atlantic Health Sciences Libraries Annual Meeting, Providence, RI, Sep. 27, 2005.

Appendix 53   PowerPoint Presentation: La Pelle, NR, Simpson EH, Luckmann R, Martin ER. *Enhancing evidence-based information access to inform public health practice*. Oral presentation at the 133rd Annual Meeting of the American Public Health Association; Abstract 108127, Session 5134. Philadelphia, PA, Dec. 14, 2005.