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Appendix A

COMPUTERS AND ELECTRONIC COMMUNICATIONS
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Adopted from a survey developed by the National Association of County & City Health Organizations (NACCHO)
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Please answer the following questions describing your local public health department's access to computers and electronic communication/information services.

LOCAL HEALTH DEPARTMENT INFORMATION

Name of local health department (LHD): _____

Street/P.O. Box: _____

City: _____ State: _____ Zip: _____

Telephone #: _____ Fax #: _____

E-mail address: _____

Name and position of person completing this form: _____

Number and types of employees in LHD - please include all sites:

Full-time employees: _____ Part-time: _____ Contract: _____

Number of sites: _____

Estimated population of your jurisdiction: _____

LOCAL HEALTH DEPARTMENT EQUIPMENT

1. Does your LHD *have access* to a facsimile (fax) machine? Yes _____ No _____

2. Please estimate the number and types of computers available in the LHD: _____

If no computers are available, please go to question 15.

	Number
PC Compatible (earlier than 486)	_____
PC Compatible (486 or Pentium)	_____
Macintosh (earlier than System 7.0)	_____
Macintosh (System 7.0 or higher)	_____
Terminal or Workstation	_____
Other (<i>please specify</i>)	_____

3. How many of these computers have *RAM memory* equal to or greater than 8 MB:

_____ none _____ all _____ some _____ don't know

How many have a *modem* equal to or greater than 14.4 Kbps:

_____ none _____ all _____ some _____ don't know

LOCAL HEALTH DEPARTMENT ELECTRONIC SERVICES

4. Do any LHD staff *have access* at the workplace to the Internet or other online services?
 yes no don't know

If yes, please go to Question 5.

If no, please go to Question 6.

5. What is the name of your Internet Service Provider? _____

6. Does your LHD have a policy that limits or prohibits access to the Internet?

yes no don't know

7. Please *estimate* the number of staff who use: (*Circle most appropriate response*)

a. E-mail	<input type="checkbox"/> none	<input type="checkbox"/> all	<input type="checkbox"/> some	<input type="checkbox"/> don't know
b. Listservs/discussion groups	<input type="checkbox"/> none	<input type="checkbox"/> all	<input type="checkbox"/> some	<input type="checkbox"/> don't know
c. Telnet/FTP	<input type="checkbox"/> none	<input type="checkbox"/> all	<input type="checkbox"/> some	<input type="checkbox"/> don't know
d. World Wide Web (WWW)	<input type="checkbox"/> none	<input type="checkbox"/> all	<input type="checkbox"/> some	<input type="checkbox"/> don't know
e. Other (<i>please specify</i>) _____	<input type="checkbox"/> none	<input type="checkbox"/> all	<input type="checkbox"/> some	<input type="checkbox"/> don't know

8. Does your LHD have its own home page on the World Wide Web?

yes (*please list URL*) _____
 no

9. If information was sent to a designated e-mail address at your LHD, how often would a staff member be likely to check for messages?

At least once a day At least once a week
 Rarely or never Not applicable

10. Is your LHD's computer system linked to any of the following? (*Please check all that apply*)

<input type="checkbox"/> County government	<input type="checkbox"/> Field offices / clinics
<input type="checkbox"/> Other LHDs	<input type="checkbox"/> Regional / district health department
<input type="checkbox"/> State health department	<input type="checkbox"/> Other (<i>please specify</i>) _____

11. Do you or your staff use online bibliographic databases or services to find information? (*Please circle all that apply*)

a. Medical literature using MEDLINE or other National Library of Medicine databases
b. CDC Wonder
c. INPHO

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- d. EPI Info
 - e. Other (*please specify*) _____
12. If you are searching online resources, where do you seek assistance in solving problems encountered in using these resources? (*Please circle all that apply*)
- a. No help is available
 - b. Vendors
 - c. Local library
 - d. Regional Medical Library
 - e. Other (*specify*)
 - e. Online tutorial
 - f. Printed manuals
 - g. On-site computer person
 - h. Colleagues
13. If you do not use online databases or services, what are your reasons for *NOT* using them? (*Please circle all that apply*)
- a. No online access
 - b. No equipment
 - c. No training
 - d. No time
 - e. Unsatisfactory results in the past
 - f. Cost
 - g. Don't know what is available
 - h. Other _____
14. Other than online resources, do you or your staff obtain information through: (*Please circle all that apply*)
- a. State health department
 - b. Medical or public library
 - c. Personal/office collection of books and journals
 - d. Colleagues/specialists available locally
 - e. Consultation with remote specialists
 - f. Other sources (*please specify*)
15. Does your LHD have plans to network or enhance its electronic communications capacity within the next year? If so, please describe.
- _____
- _____
- _____
- _____
- _____

TRAINING FOR LOCAL HEALTH DEPARTMENT STAFF

16. Have you or your staff participated in learning opportunities within the past year using: (*Please circle all that apply*)
- a. Teleconference
 - b. Audioconference
 - c. Mixed media
 - d. Satellite broadcast
 - e. Other (*please specify*) _____
 - f. Audiocassette tapes
 - g. Instructional videotapes
 - h. Packaged computer-based course
 - i. Internet course

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17. Would you be interested in having your staff learn more about searching MEDLINE (biomedical literature) and other National Library of Medicine databases?
- ___ Yes ___ No ___ Don't know
18. Would you be interested in having your staff learn more about using technology to locate resources on the Internet that might be useful for public health workers?
- ___ Yes ___ No ___ Don't know

Comments: *(Please continue on another sheet if necessary)*

Thank you for taking the time to complete this survey. Please fax to *Elaine Martin, University of Illinois at Chicago Library of the Health Sciences*, (312) 996-9584, or mail in the self-addressed envelope to: Elaine Martin, Assistant University Librarian for the Health Sciences, 1750 West Polk Street, University of Illinois at Chicago, Library of the Health Sciences, Chicago, Illinois 60612-7223.

Appendix B

Question Formats

Simple, direct questions – measure a complete thought with a specific list of responses.

Do you have Internet access at home?

Yes

No

Checklist questions – measure multiple thoughts in the same question and respondents can check all applicable responses. Essentially, checklist questions are a series of single, direct questions.

What kinds of information do you need to support your work? (check all that apply)

Consumer/patient information

Medical research

Drug information

Health statistics

Federal/state legislation

Policy issues

Funding sources

Health status indicators

Other – please specify

Scales – Consist of a series of questions (usually four or more) that measure different aspects of a thought (concept). Scales combine multiple measures because it is sometimes difficult to find that one perfect measure that will adequately represent the concept. By using multiple measures, you can feel more comfortable that you have “captured” the concept one way or another. Likert scale items are commonly used, with each item getting at a different dimension of the concept.

Consider the following example of a scale to measure the abstract concept **self-esteem** where response choices are “strongly agree” (SA), “agree” (A), “neither agree or disagree” (N), “disagree” (D), and “strongly disagree” (SD).

	1	2	3	4	5
a) At times I think I am no good at all	SD	D	N	A	SA
b) On the whole, I am satisfied with myself	SD	D	N	A	SA
c) I often feel lonely	SD	D	N	A	SA
d) My social life is very complete	SD	D	N	A	SA
e) My friends admire my honesty	SD	D	N	A	SA

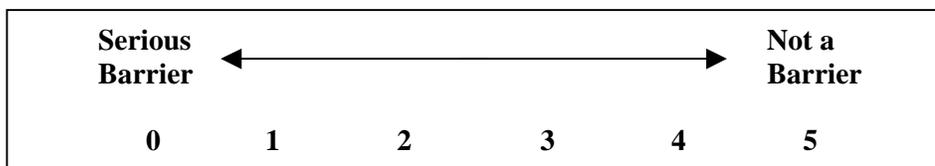
It is considered desirable that some of the statements be stated positively and others be stated negatively, to avoid unthinking, automatic responses. When analyzing the data, reverse the scoring for negatively stated items and sum the scores by person. That is, we want *high* scores associated with positive self-esteem, so for items “a” and “c,” change 1 to 5; 2 to 4; 3 stays as 3; 4 becomes 2; and 5 becomes 1. Record a scale score for each person, expressed as a mean computed from summing the student’s responses and dividing by the number of items.

Thus, a person who responds with a 1 (Strongly Disagree) on item “b” and a 4 on the other four items would have a score of .68 (17 divided by 25).

Indexes – Similar to scales, indexes consist of a series of statements, each of which has the same intensity in representing the concept to be measured. Unlike a scale, an index does not require a combination tally of the responses to represent the final score. In an index, the mean score for each response item is compared to the mean score of the other items. Patterns in the data are analyzed (i.e. responses clustered closely together).

Consider the following example of an index intended to measure **barriers** to Internet access.

Using the index below, please rate the following barriers which might affect your library’s ability to connect to the Internet.



- a) Cost of staff training and education
- b) Long-distance charges
- c) Capabilities of local phone service
- d) Availability of in-house technical expertise
- e) Level of management support
- f) Other (please specify)

Consider the following hypothetical results:

BARRIER	Mean Score
Level of management support	4.212
Cost of staff training and education	3.970
Long distance charges	1.436
Availability of in-house technical expertise	1.425
Capabilities of local phone service	1.291

There are different ways to interpret the data, but the clusters suggest that logistical issues (such as long distance charges, phone service, and in-house expertise) are less problematic than motivating support for implementation and training.

Appendix C

Sampling

Sampling is a procedure by which to infer the characteristics of a large body of people (a population) by surveying only a few (the sample). Selecting a truly random and representative sample is called *probability sampling*, which is a sophisticated technique that requires time and resources, but permits confident generalization from the sample to a larger population. *Non-probability sampling* is easier and cheaper to do, but you cannot use sample findings to infer to the larger population, nor can you evaluate the risks of error involved in making inferences.

Sampling techniques can save time and money and reduce data analysis errors (because there is less data to collect and analyze) if the alternative is to survey the entire population. Evaluation (such as needs assessments) done in many outreach settings will lack adequate time and resources to accommodate a rigorous sampling design. However, effective evaluations can still be conducted using less sophisticated sampling techniques, depending on the degree of confidence and error that is acceptable [Hernon, 1990 #11].

Sample Design

According to Hernon (1990), sample design involves the following steps:

- Defining the universe and the sampling frame
- Choosing the sampling strategy and type of sampling
- Determining the size of the sample

Defining the universe and the sampling units

The universe is the group of people (population) or items that the sample will represent. For example, the universe or population of interest could be family practice physicians in rural settings that have been selected for outreach. Or perhaps the program has yet to be defined, and the research is at the needs assessment phase. In this case, the population might be more diffuse, such as all health providers in rural settings.

The sampling frame is the actual list of units from which the sample will be selected. For example, the list might be individuals, households, public libraries, or journals in a library collection. If the universe or population for an outreach needs assessment is health providers in rural settings, the sampling frame would be a list of practicing health providers as of the date of the study within the geographic area of interest. The list is useful to identify, because it will provide the units from which to draw the sample.

Choosing the sampling strategy and type of sampling

When choosing a sampling strategy, several factors should be considered. First, is a sample needed or is the universe small enough that it makes more sense to research the whole population? For a targeted community of rural health clinics, for example, the total number of health providers might be small enough that trying to select and get results from a representative sample might be more work than simply assessing the whole group. However, if a community profile has determined a priority need for outreach by family physicians in *any* rural practice setting, conducting an audience profile of a sample selected from the list of physicians in the state academy of family practitioners might save time and money.

Second, if a sample will be selected, will it be necessary to conduct probability (statistical) sampling? If it is not feasible to compile a list of sampling units, random selection (required for statistical samples) will not be possible. In addition, if one does not intend to generalize to a universe, probability sampling is not necessary. Non-probability samples may provide enough information and are less cumbersome to select. Some *types of non-probability samples* are:

Convenience sample: Cases (the units of study) are selected as they become available until the sample reaches the desired designated size. For example, you might select people stopping by an exhibit booth.

Quota sample: A variation of convenience sampling. In a quota sample, you would attempt to include significant elements of the population in some proportion. For example, if you wanted to survey visitors of an exhibit booth at a public health conference, you would try to get 80% professionals and 20% students (if that is the distribution of these categories in the conference registration).

Volunteer or self-selected sample: As the name suggests, the respondents select themselves for inclusion in the study. For example, volunteers who would be willing to test a new long distance learning module about searching PubMed.

If you do intend to make generalizations from your study, probability samples are preferred so that you can make reliable estimates of the whole population. In a probability sample, every element in the population has a known probability of being included in the sample. There are several *types of random samples*, such as:

Simple random sample: Units are selected so that every one has a known and equal chance of being selected. It is like a lottery, and can be done in various ways such as using a random numbers table, or a randomized computer selection, or simply pulling names from a hat.

Systematic random sample: This method is considered simpler and more convenient than random sampling, especially for long lists. Once the first member of the population is chosen, other members are automatically determined. For example, every 30th name on a page.

Stratified sampling: This technique first divides the list of units into two or more parts, and a sample is selected from each. The parts may be selected in proportion to their numbers in the population itself.

Determining the size of the sample

The following discussion is excerpted, with permission (have to get it), from course curricula by Alexandra Dimitroff (1997):

The goal in selecting an appropriate sample size is to minimize sampling error while keeping costs within reasonable limits. Four criteria need to be considered:

1. *Degree of precision needed:* If you are willing to tolerate less accuracy, the sample can be smaller.
2. *Variability of the population:* The greater the variability within the population, the larger the sample needs to be to insure adequate representation of all segments. The more homogeneous the population the smaller the sample can be.
3. *Method of sampling:* Stratified random sampling requires fewer cases to achieve a specified degree of accuracy than does simple random sampling. Systematic random sampling usually requires a larger sample than both stratified and SRS.
4. *Method of analysis:* Very small samples will limit the types of statistics that can be used in analyzing the data.

There are statistical formulas for calculating appropriate sample sizes. However, an easier alternative is to use a table, available in standard statistical textbooks, and also included as Appendix A3 in this manual. To determine the required sample size you need only find your population size (N) and note the adjacent sample size (S). It is clear that as population size increases, the rate of increase in sample decreases.

Non response

Whatever is determined to be an appropriate sample size must be increased by the estimated non-response rate. For example, if you want a sample of 100, you need to draw a sample of 100 plus an additional number to cover non-responders. Assuming a 75% response rate, you will need:

$$\frac{100 \text{ (desired sample size)}}{1 - .25 \text{ (estimated nonresponse)}} = 133$$

You need to mail out 133 questionnaires to get your sample of 100 if you are lucky enough to get a 75% response rate.

Appendix D

Sample Outreach Goals and Objectives

Project Goals

To assist Geneva Health in developing connections to the Internet in order to:

- Provide access to health information
- Minimize isolation
- Improve quality of health care

Process objectives

During the next 18 months:

Adequate hardware, software, and connectivity will be purchased and installed for sufficient Internet capacity at Geneva Health.

Collaborations with local, state, regional or federal organizations or agencies will be established for sustained Internet connectivity at Geneva Health.

Outreach staff will conduct at least two educational activities at sites of Geneva Health to increase motivation, skill, use, and exchange of electronic health information resources.

At least one person per site will be designated as an onsite resource for follow-up training and questions.

Outreach staff will facilitate strategies or partnerships between the clinic, professional associations, and the state medical school to encourage student rotations at the clinic.

Outreach staff will establish “primary library” relationships for Geneva Health clinicians.

Educational objectives

During the next 18 months:

At least 50% of health providers at Geneva Health will participate in at least one educational outreach activity conducted by outreach staff at each site.

Outcome (what): Will participate in an educational outreach activity

Target population (who): Health providers

Conditions (when): During the next 18 months

Criterion (how much): 50%

Awareness level: At least 30% of outreach participants will be able to identify a National Library of Medicine online resource.

Outcome (what): Will be able to describe a National Library of Medicine online resource

Target population (who): Outreach participants

Conditions (when): During the next 18 months

Criterion (how much): 30%

Attitude level: At least one out of three outreach training participants will rate one online resource as an essential resource for their work.

Outcome (what): Will rate one online resource as an essential tool for their work.

Target population (who): Outreach training participants

Conditions (when): During the next 18 months

Criterion (how much): At least one out of three

Knowledge level: At least one out of three outreach training participants will correctly answer a true/false question about finding evidence based literature.

Outcome (what): Correctly answer a true/false question

Target population (who): Outreach training participants

Conditions (when): During the next 18 months

Criterion (how much): At least one out of three

Skill level: At least one out of three outreach training participants will correctly answer a true/false question based on a simple search of a National Library of Medicine online resource.

Outcome (what): Correctly answer a true/false question

Target population (who): Outreach training participants

Conditions (when): During the next 18 months

Criterion (how much): At least one out of three

Behavioral and environmental objectives

By the end of outreach activities:

Geneva Health clinic sites will report satisfactory data communication reliability.

Outcome (what): Will report satisfactory data communication reliability

Target population (who): Geneva Health clinic sites

Conditions (when): By the end of outreach activities

Criterion (how much): All sites

At least two Geneva Health clinic sites will receive high technology readiness ratings when evaluated by the state university medical school as a site for school student rotations.

Outcome (what): Will receive high technology readiness ratings

Target population (who): Geneva Health clinic sites

Conditions (when): By the end of outreach activities

Criterion (how much): At least two sites

At least two Geneva Health clinic sites will have doubled their access to full text resources, as measured by increases in Loansome Doc requests.

Outcome (what): Will have doubled their access to full text resources

Target population (who): Geneva Health clinic sites

Conditions (when): By the end of outreach activities

Criterion (how much): At least two sites

At least 30% more clinicians in outreach training will report they will very likely consult Internet resources for answers to clinical questions.

Outcome (what): Will report they will very likely consult Internet resources

Target population (who): Clinicians in outreach training

Conditions (when): By the end of outreach activities

Criterion (how much): At least 30% more

Program Objectives

Three months after outreach is completed:

At least 60% of outreach training participants will report continued use of the Internet for health resources.

Outcome (what): Will report continued use of Internet for health resources

Target population (who): Outreach training participants

Conditions (when): Three months after outreach is completed

Criterion (how much): At least 60%

At least 70% of those who have done follow-up Internet health searches will report finding satisfactory search results

Outcome (what): Will report finding satisfactory search results

Target population (who): Those who have done follow-up health information searches

Conditions (when): Three months after outreach is completed

Criterion (how much): At least 70%

At least 30% more outreach participants will report using online resources of medical literature for patient care decision making.

Outcome (what): Will report using online resources of medical literature

Target population (who): Outreach participants

Conditions (when): Three months after outreach is completed

Criterion (how much): At least 30%

Appendix E

Diffusion of Innovations Theory

According to Diffusion of Innovation, people adopt innovations more rapidly if they are perceived as having greater relative advantage, compatibility, trialability, observability, and less complexity than other innovations. You have conducted a needs assessment of your targeted audience which revealed their barriers, beliefs, and attitudes about using the Internet. Based on principles from Diffusion of Innovations theory, your class strategy will focus on:

Advantage: You will illustrate how current information-seeking methods compare to the Internet, such as: “Right now you’d have to drive two hours to the nearest hospital library and spend the day copying articles and pamphlets. With the Web you will be able to stay in your own office.” Or “With access to your office’s Web-accessible informational materials, people can find the AIDS information they need in the privacy and security of their own home.”

Compatibility: You will compare – very directly – a current manual system with an automated one. “Now you have pamphlets in the office for your patients, but you don’t know if there’s a new edition, you don’t know how many you’ll need to order from the federal government, and the pamphlet you have in Spanish for your Hispanic patient population out of date. With the Internet, you can link to the most recent edition of pamphlets, print only as many as you need, and even edit another agency’s pamphlet to add details your patients need about local services.”

Complexity: You are concerned about piling on too much, too fast. So you start with a simple example. “You can’t live without the phone book, but it’s just one book. Start on the Internet by finding just one resource that is very useful. For the first week use that one. You might find it just as important to your work as the phone book! The Internet is useful even if you just use a few good sites. Bookmark them and return to them; don’t try to find everything on the Web the first week, just like you wouldn’t expect to find everything in a new city the first week. Go to the familiar places!”

Trialability: You will use “supervised play” and work to find the right balance of independent exploration and help. With a new group you stay available, but don’t hover and correct. You wait for an invitation to help, which usually comes at some critical moment of exasperation. Most importantly, you do not grab the mouse and do it yourself! You also encourage peer-to-peer help.

Observability: You will provide a slow demonstration to the group, then follow with a simple exercise that has no guesswork – an exercise that gives all the steps and brings the learner to something useful. You assess the group ahead of time about skill level so that the exercises build on current skills. However, you also observe people doing the exercises and modify learning objectives if necessary, so that you can be sure that what is learned will be well learned.

Appendix F

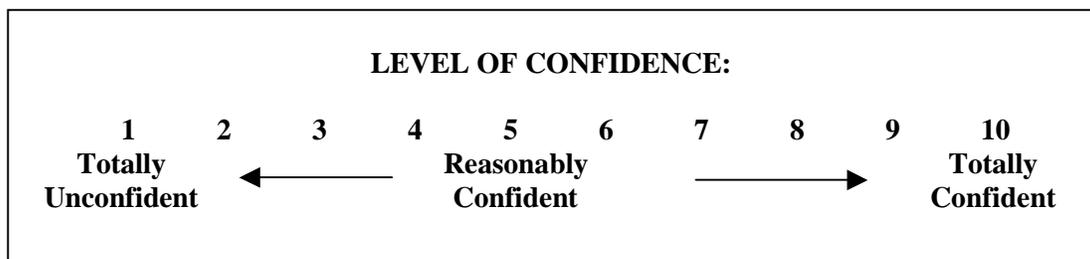
Self-efficacy Measure

Reprinted with permission by Shelda Debowski and Robert E. Wood

[Note: These questions are based on tasks relevant to CD-ROM search skills. Revise questions as needed to measure confidence in searching other tools, such as Web-based resources].

The first questions ask you to record how confident you feel about performing the different tasks involved in conducting a CD-ROM literature search, at this point in time – that is, before commencing the task. For each question, you are asked to make two responses:

1. Could you perform the task if you wished to? If your answer is **Yes**, please list a **Y** in the **CAN DO** column. If you **do not** believe you could, please list an **N** for **No** in this column.
2. For each task, you are also asked to indicate how confident you feel of your ability to perform the described task. Using the scale below as a guide, select the appropriate number and enter it in the **CONFIDENCE** column.



I can:	<i>CAN DO</i> (Yes or No)	<i>CONFIDENCE</i> (1-10)
1. Use a thesaurus to identify key words for use in the search.	_____	_____
2. Determine the appropriate key words to use in the literature search statement.	_____	_____
3. Identify the major requirements of the search from the initial statement of the topic.	_____	_____
4. Use connecting terms like "and", "or" and "not" when designing a search statement.	_____	_____
5. Correctly develop a search to reflect my requirement statements.	_____	_____
6. Evaluate the resulting list to monitor the success of my approach.	_____	_____

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I can:	<i>CAN DO</i> (Yes or No)	<i>CONFIDENCE</i> (1-10)
7. Develop a search strategy that will identify a large number of appropriate resources.	_____	_____
8. Complete a CD-ROM search in 30 minutes, with the use of published manuals to guide me.	_____	_____
9. Obtain a printed list of resources with titles similar in quality to those obtained by a professional searcher.	_____	_____
10. Perform a search that will result in at least twenty valid references on the stipulated topic.	_____	_____
11. Efficiently structure my time to complete the task in the stipulated time period of thirty minutes.	_____	_____
12. Devise a search that will result in a very small percentage of irrelevant items on the list.	_____	_____
13. Produce a print-out of my search that includes at least some titles that are the same as those obtained by a professional literature searcher.	_____	_____
14. Produce a list that does not include any irrelevant titles.	_____	_____
15. Use manuals on searching to help me structure my approach.	_____	_____
16. Use guidelines effectively when developing my search strategy.	_____	_____
17. Identify a solution to a problem using the published aids on literature searching.	_____	_____
18. Complete the CD-ROM search competently and effectively.	_____	_____
19. Complete the individual steps of the CD-ROM search with little difficulty.	_____	_____
20. Structure my time effectively so that I will finish the search in the allocated time.	_____	_____
21. Apply the guidelines I receive in an appropriate fashion, in order to complete the task correctly.	_____	_____

Appendix G

Sample Formative Evaluation Questions for Behavior Change Theories

Social Learning Theory

Self efficacy, or the degree of perception of one's ability to find useful information:

On a scale of 1-5, how confident are you in your own ability to find information on the Internet?
(Circle the number of your choice)

1	2	3	4	5
Not at all Confident		Reasonably Confident		Totally Confident

Expectations, or the degree of confidence that relevant information is available:

On a scale of 1-5, how confident are you that the Internet has information you need? (Circle the number of your choice)

1	2	3	4	5
Not at all Confident		Reasonably Confident		Totally Confident

Extended Parallel Process Model (EPPM)

Threat, including severity of and susceptibility to threat: The degree of belief about the seriousness of a problem, and the degree that one feels at risk for experiencing the problem.

What negative consequences for you, if any, come from lacking information or being misinformed? (determines audience perceptions of the threat)

What is the best way to prevent experiencing the negative consequences just identified?
(determines audience perceptions of the "best" recommended response)

How likely is it that you will experience the negative consequence from not accessing resources for current health information? (perceived susceptibility to the threat)

Efficacy, including self-efficacy and response efficacy: The degree to which one feels able to access resources for current health information to avert the negative consequences; and the degree to which one feels that the resources will have information that is needed.

Accessing health resources on the Internet will keep me from experiencing negative consequences identified above. Why or why not? (perceived response efficacy)

I am easily able to access health resources on the Internet. Why or why not? (perceived self-efficacy)

Stages of Change

Determines which stage of readiness the audience is in.

Choose the statement that best represents your thoughts and actions:

1. Yes No I have yet to think about using Pub Med. (*precontemplation*)
2. Yes No I have thought about using Pub Med but have not taken any steps to use it yet. (*contemplation*)
3. Yes No I have not yet used Pub Med but have taken steps so that I will be able to use it soon (e.g., hooked up to internet, signed up for training, sent away for information). (*preparation – never used*)
4. Yes No I have used Pub Med. (*action*)
5. Yes No I regularly use Pub Med. (*maintenance*)
6. Yes No I have used Pub Med before but currently do not use it. (*relapse -> go to either preparation or contemplation stage*)

Diffusion of Innovations Theory

Critical mass: the point at which enough individuals have adopted an innovation that any further rate of adoption becomes self-sustaining. Early adopters and opinion leaders are critical in getting an innovation to the point of critical mass.

Please list the people or groups who you consider to be local opinion leaders in your [community, profession]:

Appendix H

Internet Skills Training Workshop Audience Assessment

1. **Circle the category which describes your profession:**
 - a. physician
 - b. nurse
 - c. dentist
 - d. administrator
 - e. pharmacist
 - f. physical therapist
 - g. other health care provider _____
 - h. other _____

2. **What negative consequences for you, come from lacking health information?**

3. **What is the best way to prevent experiencing the negative consequences just identified?**

4. **How likely is it that you will experience the negative consequence?**

5. **Accessing health resources on the Internet will keep me from experiencing negative consequences identified above. Why or why not?**

6. **I am easily able to access health resources on the Internet. Why or why not?**

7. **Choose the statement that best represents your thoughts and actions:**
 - a. Yes No I have yet to think about using the Internet for health information.
 - b. Yes No I have thought about using the Internet for health information but have not taken any steps to use it yet.
 - c. Yes No I have not yet used the Internet for health information, but have taken steps so that I will be able to use it soon (e.g., obtained Internet access, signed up for training, sent away for information).
 - d. Yes No I have used the Internet for health information.
 - e. Yes No I regularly use the Internet for health information .
 - f. Yes No I have used the Internet for health information before, but currently do not use it.

8. PubMed is an essential tool for my work:

1	2	3	4	5	6	7
Strongly Disagree						Strongly Agree

9. On a scale of 1-5, please rate your ability to do the following tasks:

Level of Ability				
1	2	3	4	5
I don't know how		I think I can		I'm sure I can

- | | | |
|---|-------------------------|-------|
| | <i>Ability</i>
(1-5) | |
| a. I can use a computer keyboard | _____ | _____ |
| b. I can use a computer mouse | _____ | _____ |
| c. I can send or receive email | _____ | _____ |
| d. I can use bookmarks | _____ | _____ |
| e. I can find medical research about diabetes on at least one Internet site | _____ | _____ |
| f. I know what PubMed is | _____ | _____ |
| g. I can narrow results of a Web search to find relevant hits | _____ | _____ |

10. In the past month, how often have you used the Internet to gain needed health care information?

- ___ Daily
- ___ Weekly
- ___ Monthly
- ___ Rarely
- ___ Never

11. What are your reasons for NOT searching the Internet for health information? (Circle all the apply):

- | | |
|----------------------|------------------------------------|
| a. lack of equipment | f. prefer others to do my searches |
| b. cost of searching | g. dislike of computers |
| c. lack of training | h. unsatisfactory past results |
| d. lack of time | i. no access to journals once |
| e. not needed | j. other |

12. Please list 3 local or regional opinion leaders in your work (people or organizations).

a.

b.

c.

13. Was there a time during the past week when you needed an answer or a piece of information and couldn't find it readily? If so, please describe the question or kind of information you needed.

14. Is there anything that you particularly want covered in this workshop?

Appendix I

Implementation Plan Outline

Name of Outreach Program: Outreach to Geneva Health Community and Migrant Health Center.

Program Goal: Geneva Health clinic sites will establish and maintain Internet connectivity to access and share clinical and patient resources that benefits patient care.

Process objective #1

During the next 18 months, adequate hardware, software, and connectivity will be purchased and installed for sufficient Internet capacity at Geneva Health.

Activity: Develop and conduct interview or survey of stakeholders regarding wishes/needs for information access and technology requirements. Order and install equipment and telecommunications network.

Strategy: Based on *Community Organization*, involve stakeholders in a technology needs assessment and subsequent decisions about where and what hardware and software should be installed and how connectivity will be provided.

Process objective #2

During the next 18 months, collaborations with local, state, regional or federal organizations or agencies will be established for sustained Internet connectivity at Geneva Health.

Activity: Work with stakeholders interested in improved health care for the counties in identifying and negotiating partnerships or funding sources to support continued Internet connectivity

Strategy: Based on *Community Organization*, use principles of community capacity development—maximizing the community’s resources and empowering problem solving.

Process objective #3

During the next 18 months, outreach staff will conduct at least two educational activities at sites of Geneva Health, the health district, and K-12 schools to increase motivation, skill, use, and exchange of electronic health information resources.

Activity: Based on audience assessment results, schedule appropriate demonstration or training workshops at each clinic.

Strategy: Based on theories of behavior change (e.g. *Stages of Change Model*), include questions in audience assessment to determine stage of readiness, such as level of ability and interest in training.

Process objective #4

During the next 18 months, at least one person at each site will be trained as the designated site expert and trainer.

Activity: Work closely with key contacts in clinics to identify and support designated staff person about who will receive “train the trainer” training for an ongoing role in helping troubleshoot local information access problems or questions.

Strategy: Follow lessons learned from outreach studies showing that personal contact between the target audience and librarians helps sustain changes in information seeking habits (Dorsch, 1997; Burnham and Perry, 1995).

Process objective #5

During the next 18 months, outreach staff will facilitate strategies or partnerships between the clinic, professional associations, and the state medical school to encourage student rotations at the clinic.

Activity: Schedule interviews or meeting with stakeholders (including student representative) interested in recruitment for medical school student rotations. Determine resources, skills, or services that outreach can address.

Strategy: Follow lessons learned from outreach studies and principles from community organization showing that collaboration and partnering provide more opportunities for reaching shared goals.

Process objective #6

During the next 18 months, outreach staff will establish “primary library” relationships for Geneva Health clinicians.

Activity: In training activities, include in-class demonstrations, plus a handout with step-by-step instructions, about how to use Loansome Doc. Include the Lib ID number for the Gowan Library

Strategy: Based on *Diffusions of Innovation* principles, demonstrate the ease and convenience of getting full text information, even in remote and rural areas.

Educational objective #1

During the next 18 months , at least 50% of health providers at Geneva Health, the health district, and the K-12 schools will participate in at least one educational outreach activity conducted by outreach staff at each site.

Activity: Develop and distribute promotional flyers with endorsements from opinion leaders about the usefulness of Internet resources for patient care decisions, and encouraging health care providers to participate in outreach educational activities.

Strategy: Based on *Diffusion of Innovations Theory*, identify opinion leaders and early adopters who will endorse the use of Internet resources.

Educational objective #2

Awareness level: During the next 18 months, at least two out of three outreach training participants will be able to describe a National Library of Medicine online resource.

Activity: Demonstrate example searches from National Library of Medicine resources that are tailored to actual need of audience.

Strategy: Based on the *observability* variable in *Diffusion of Innovations Theory* (extent to which the innovation provides tangible or visible results), add questions to audience assessment to determine specific information needed by audience.

Educational objective #3

Attitude level: During the next 18 months , at least one out of three outreach training participants will rate one online resource as an essential resource for their work.

Activity: In training activities, add threatening messages to motivate access to current health information via the Internet.

Strategy: Based on the Extended Parallel Process Model, use an audience assessment to assess threat and efficacy variables and develop a message about effective ways to avoid negative consequences of being misinformed (e.g. “Stay ahead of your patients with easy access to current clinical care information on Pub Med”).

Educational objective #4

Skill level: During the next 18 months, at least one out of three outreach training participants will correctly answer a true/false question based on a simple search of a National Library of Medicine online resource.

Activity: Demonstrate search skill techniques followed by progressively difficult hands-on exercise and a question to test understanding

Strategy: Based on using *proximate goals* to increase *self-efficacy* (from *Social Learning Theory*), develop hands-on exercises designed to help students master skills progressively.

Appendix J

Gowan Library – Outreach Implementation Plan Timeline (selected tasks)

Task	Person	Month											
		1	2	3	4	5	6	7	8	9	10	11	12
Consult literature about information needs of rural health professionals.		X											
Hold meetings or interviews with key contacts and stakeholders. Discuss information needs of health intermediary communities and how outreach might help.		X											
Develop goals and objectives for outreach based on mutual interests.		X											
Review process objectives and develop activities and strategies to implement them.		X											
Review educational objectives and develop strategies and activities for each one, identifying what audience feedback will be needed in advance of outreach.		X											
Develop draft audience assessment questionnaire.			X										
Revise questionnaire based on review by program stakeholders (including a representative member of audience).			X										
Conduct audience assessment among a sample of health providers from all sites.			X										
Gather and analyze survey results.				X									
Based on results, tailor outreach activities to needs of audience.				X									
Develop post-test questions or end of activity evaluation.				X									
Schedule activity, time and place for demonstrations or training workshops				X									
Identify opinion leaders or early adopters who will endorse and promote outreach activities				X									
Develop promotional flyers about outreach activities with endorsements and persuasive messages.				X									

Appendix K

Sample Evaluation Objectives for Process Evaluation

ACCOUNTABILITY

Think through: Will I be accountable for documenting what occurred as the program happened? If so, what is most important to document?:

- a. Briefly, describe the program's goals and objectives. (*Ask evaluation stakeholders to verify or modify*)

EXAMPLE:

Goal 1: Geneva Clinic sites will establish and maintain Internet connectivity to access and share clinical and patient resources that benefits patient care.

Goal 2: The health district will use online information resources of national, state, and local agencies to improve its programs and services.

Goal 3: School-based health curriculums will integrate computer-based health information to impact health behaviors of K-12 youth.

Goal 4: The role of medical librarians will improve the use and impact of health information resources in delivery of health care and health education

Objectives (brief)

- To improve information access infrastructure through increased connectivity and/or hardware
 - To provide effective skills training
 - To raise awareness, skills, beliefs, and attitudes of health providers about Internet resources for exchange and access to health information
 - To increase professional use of Internet resources for health information
 - To increase community-based involvement and support of health information access needs
- b. What do you see as the most important results or outcomes of the program? (*Ask evaluation stakeholders to verify or modify*)
- Optimal leveraging of current infrastructure
 - Technology improvements implemented and functioning
 - Ensured Internet access after NN/LM funding expires
 - Designated onsite advocate and support for health information access
 - Increased capability to recruit health providers or students
 - Effective educational activities
 - Significant participation in outreach educational activities
 - Increased use of Internet resources to access health information
 - Increased use of health information resources for patient care decisions
 - Increased recognition of value of librarian and/or access services

c. How will the program be implemented? Describe the resources, activities, services, and administrative arrangements that constitute the program.

EXAMPLE:

Each clinic site will define their current resources and technology needs for new or enhanced telecommunications access.

Objectives for technology implementation will be agreed upon and listed per site.

A timeline for equipment and connectivity implementation will be established for each clinic.

NN/LM staff will work with each outreach site to identify opportunities for effective promotional and educational activities about the availability of networked health information sources relevant to their needs. Activities might include:

- NN/LM exhibits at school health fairs
- Educational articles distributed through local primary care or public health listservs
- Training workshops

Determine accountability objectives to obtain periodic updates on characteristics of the program (activities and best practices) that will most determine its success. (*Determine in advance what the report questions will include. Ask evaluation stakeholders to verify or modify*)

Activities: how is the program being implemented?

- Procedures staff follow to understand participants, including their number, why and how they are being targeted (understanding of need), and level of readiness. Are these procedures working?
- Procedures staff follow to leverage effective and timely implementation of equipment and connectivity. Are these procedures working?
- Promotional activities: What is being done?
- Educational activities: What is being done?
- Other _____

Best practices: what evidence is there that best practices are being used, such as:

- Identify mutual outreach objectives with targeted community
- Involve opinion leaders in planning and promotion
- Coordinate with site liaison to plan and promote promotional and educational activities. Are contacts effective?
- Provide follow-up feedback or training
- Motivate interest in conducting literature searches as a basis for clinical decision-making (see process evaluation measures for theory-based strategies below)
- Promote at least minimal onsite information services.
- Partner with agencies or organizations with mutual interest to support or improve information access capability
- Determine readiness to use computers to access health information
- Promote success service modules, such as circuit librarian programs and Area Health Education Centers (AHECS)
- Focus educational efforts on individuals and institutions where they practice
- Promote Loansome Doc or other ways to access full text resources (may need to be subsidized)
- Promote local, regional, or cooperative arrangements to improve telecommunications infrastructure

- Other? _____

PROGRAM IMPROVEMENT

Determine measures for program objectives

Will there be an opportunity to make adjustments to the activities and strategies targeted at program objectives (if progress is inadequate)? If so, how can progress toward objectives be tracked?

Think through:

- a. What are the outcomes listed in each objective?

Example from the Sample Plan for Measuring Outcomes(Appendix J):

Objective After each class session, at least one out of three participants will report a heightened threat of not staying current (e.g. patients are becoming more informed) *and* a heightened confidence that learning Internet-based resources will be helpful

Outcome: Participants' level of threat of being ill-informed and level of efficacy (or confidence) in averting the threat by learning Internet skills

- b. What indicators will provide measurable evidence of those outcomes?

Indicator: Participants' level of threat and efficacy

- c. How can those indicators be tracked?

Measure: Pre- and post-training class question about level of threat and efficacy

Think through: What variables can be measured to show whether the theory-based strategies are working? (Review objectives and strategies identified in the implementation plan outline developed in Stage 3)

Example from Sample Implementation Plan Outline (Appendix G).

Educational objective: During the next 18 months , at least one out of three outreach training participants will rate one online resource as an essential resource for their work.

Strategy: Based on the Extended Parallel Process Model, use an audience assessment to assess threat and efficacy variables and develop a message about effective ways to avoid negative consequences of being misinformed (e.g. “Stay ahead of your patients with easy access to current clinical care information on Pub Med”).

To measure: Conduct a post- survey (end of class) to track scores about perceptions of threat and efficacy. Results will determine whether the intervention was promoting danger control actions (i.e., adoption of the recommended response) or fear control actions (i.e., defensive avoidance). Desired results would be high threat and high efficacy, because the high threat motivates action when accompanied by a sense of effectiveness in averting the threat. If results are high threat, but low efficacy scores, the strategy might fail because people are more likely to use avoidance behavior to control the fear, when it is accompanied by a low sense of efficacy.

Following are examples of questions for each of these constructs:

Perceived Threat

Perceived Susceptibility

1. I am at-risk for falling behind current medical knowledge.

1	2	3	4	5	6	7
Strongly						Strongly
Disagree						Agree

Perceived Severity

2. It is dangerous to fall behind current medical knowledge.

1	2	3	4	5	6	7
Strongly						Strongly
Disagree						Agree

Perceived Efficacy

Perceived Response Efficacy

3. Using PubMed prevents me from falling behind current medical knowledge.

1	2	3	4	5	6	7
Strongly						Strongly
Disagree						Agree

Perceived Self-Efficacy

4. I am easily able to use PubMed to avoid falling behind current medical knowledge.

1	2	3	4	5	6	7
Strongly						Strongly
Disagree						Agree

Suppose that the EPPM was used to theoretically guide the intervention and evaluation. If the average scores of one's class on the above four measures were #1 = 5.6, #2 = 6.1, #3 = 6.9, #4 = 6.2, then one could see that the intervention was promoting high levels of threat (5.6 and above) and extremely high levels of efficacy (6.2 and above). With these scores one could be confident that the intervention was working well because according to the guiding theory, high threat/high efficacy interventions promote adoption of the recommended response. On the other hand, suppose the average scores were #1 = 6.2, #2 = 6.7, #3 = 2.1, #4 = 3.0. These scores would indicate that the intervention was promoting very high threat perceptions and low efficacy perceptions. According to the guiding theory, an intervention producing these type of responses would fail, because it would be promoting fear control responses (such as defensive avoidance and reactance) resulting in no behavioral changes.

REPLICATION

Think through: Is the outreach program considered a pilot project, or is it likely to be replicated at another site? If so, what types of information would be most useful to track for eventual documentation? Check off the types of information to track from the following list, and ask relevant stakeholders to add other data you may want to collect:

- ❑ Where exactly has the outreach program been implemented and what was done?
- ❑ How many and what sorts of people participated in the outreach? (e.g. age, sex, health profession)
- ❑ What are the characteristics of their information needs? (e.g. type of practice, types and purposes of information needed, frequency of information need, sources used)
- ❑ What are the socioeconomic characteristics of the setting?
- ❑ What does(do) the outreach site(s) look like?
- ❑ What are the programs' greatest successes? What facilitated each one?
- ❑ What are the programs' biggest challenges (frustrations, barriers, or disappointments)? What caused each one?
- ❑ What sociopolitical factors may have impacted the outreach?
- ❑ What were the outreach costs in staff time, materials, equipment, and facilities?
- ❑ Other questions?

Appendix L

Sample Ways to Measure Process

Activities, Best Practices, Theory-based Strategies	What will be measured?	How will we measure it?
Effective and timely implementation of equipment and connectivity.	Procedures expected to work (e.g. coordination with onsite technical support)	--observation/journal --project timeline compared with initial action plan --feedback from site
Effective planning for promotion and implementation of activities	Assumptions about how plans will be implemented (e.g. level of onsite support and cooperation, administrative impact at site)	--observation/journal --feedback from site personnel --comparison between plans and what happened --numbers of promotional materials distributed
Mutual outreach objectives identified with targeted community	Assumptions about how objectives would be discussed with site contacts	--observation/journal --feedback from site personnel
Involvement of opinion leaders in planning and promotion	Strategies for recruiting opinion leader participation	--observation/journal --feedback from site personnel --numbers of leaders recruited
Progress toward educational objective, such as: At least 30% more outreach participants will be able to identify a National Library of Medicine online resource.	Identification of NLM online resources by health providers	Exit measure (e.g. end of class survey) to identify an NLM resource and to ask whether heard of NLM before training
Spot checks about effectiveness of theory. For example, motivation to use Internet resources based on Extended Parallel Process Model	Attitudes about threat of being misinformed and efficacy of PubMed	Exit measures (e.g. end of class survey) about perceptions of threat and efficacy
Progress toward educational objective, such as knowledge	Participants' level of knowledge in skills to search NLM resources	In-class exercise with a true/false question based on a simple search of a National Library of Medicine online resource
Progress toward educational objective, such as intended use	Intended use of Internet resources	Exit measure (e.g. end of class survey) regarding intended use on end of class survey
Programs' greatest successes? Greatest need for improvement?	Assumptions about components or characteristics expected to work. Unanticipated factors contributing to success or problems	Exit measures of satisfaction with activity or service Feedback from site personnel Feedback from project personnel

Appendix M

Sample Exit Questionnaire

This questionnaire is designed to help us better understand ways to improve our class. Your responses will be anonymous and confidential. Thank you!!

1. Circle the category which describes your profession:

- a. physician
- b. nurse
- c. dentist
- d. administrator
- e. pharmacist
- f. physical therapist
- g. other health care provider _____
- h. other _____

2. I am at-risk for falling behind current medical knowledge.

1	2	3	4	5	6	7
Strongly Disagree						Strongly Agree

3. It is dangerous to fall behind current medical knowledge.

1	2	3	4	5	6	7
Strongly Disagree						Strongly Agree

4. Using PubMed prevents me from falling behind current medical knowledge.

1	2	3	4	5	6	7
Strongly Disagree						Strongly Agree

5. I am easily able to use PubMed to avoid falling behind current medical knowledge.

1	2	3	4	5	6	7
Strongly Disagree						Strongly Agree

6. On a scale of 1-5, please rate your ability in the following areas:

1. None 2. Some 3. Moderate 4. Above average 5. Super

I can narrow results of a Web search to find relevant hits _____

I can find evidence based research articles on PubMed _____

7. **True or False?: “To use PubMed, I need to sign up for a password”**

True _____

False _____

8. **In the next month, how often do you anticipate using the Internet to find health information?**

- ___ daily
- ___ weekly
- ___ monthly
- ___ rarely
- ___ none

9. About the workshop:

Please rate the following statements by circling your choice

(Strongly Disagree, Disagree, Neutral, Agree, Strongly Agree)

The information was presented in an understandable manner	SD	D	N	A	SA
The instructors were effective in explaining the material	SD	D	N	A	SA
The computer screen was easy to see	SD	D	N	A	SA
There was enough hands-on practice	SD	D	N	A	SA
I received adequate help during the hands-on session	SD	D	N	A	SA

9. **What was the most valuable part of the workshop? What was the least valuable?**

10. **What, if any, improvements (e.g., content, presentation, logistics) would you recommend?**

11. **Would you recommend this workshop to a colleague?**

Appendix N

Sample Ways to Measure Outcomes

Objectives	What outcome will we measure?	How will we measure it?
Adequate hardware, software, and connectivity will be purchased and installed for sufficient Internet capacity at Geneva Health.	Infrastructure improvements as designated by each clinic (e.g. connectivity)	Functional testing
Collaborations with local, state, regional or federal organizations or agencies will be established for sustained Internet connectivity at Geneva Health.	Collaborative efforts to continue Internet connectivity	Journal of contacts made. Written agreements
Outreach staff will conduct at least two educational activities at sites of Geneva Health, the health district, and K-12 schools	Implementation of activities	Log of activities scheduled and conducted
Outreach staff will facilitate strategies or partnerships between the clinic, professional associations, and the state medical school to encourage student rotations at the clinic.	Appeal of clinic facility to medical students for rotation	Medical school criteria of student rotation site
At least 50% of health providers at Geneva Health, the health district, and the K-12 schools will participate in at least one educational outreach activity conducted by outreach staff at each site.	Participation in outreach activities	Tally of outreach activities Attendance counts
By the end of year one, at least one liaison will be designated as an onsite resource for follow-up training and questions.	Development of onsite personnel as liaison or technical support	<ul style="list-style-type: none"> • Feedback from site and outreach staff • Interview with site liaison
At least 30% more clinicians in outreach training will report they will very likely consult Internet resources for answers to clinical questions.	Intention to use Internet resources	Baseline and comparison measure before and after outreach
<i>Attitude level:</i> At least one out of three outreach training participants will rate one online resource as an essential resource for their work.	Feelings about value of online resources	Follow-up measure regarding attitude

Appendices

At the end of outreach training, at least 50% of all outreach sites will have doubled their access to full text resources, as measured by increases in Loansome Doc requests	Numbers of Loansome Doc requests	Baseline and follow-up data on numbers of Loansome Doc requests
Three months after outreach is completed, at least 60% of outreach training participants will report continued use of the Internet for health resources.	Continued use of Internet resources	Follow-up measures of use
Three months after outreach is completed, at least 70% of those who have done follow-up Internet health searches will report finding satisfactory search results at least 3 out of 5 times.	Value or usefulness of information obtained	Follow-up measures about satisfaction with results
Three months after outreach is completed, those who report doing follow-up Internet health searches will describe whether and how the searches have made an impact on subsequent health related actions or decisions.	Impact on actions or decisions	Follow-up measures about how information was used

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