RURAL RESIDENTS AND HEALTH INFORMATION

by

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The ability to have quick and easy access to current, up-to-date medical and health information is often lacking or inadequate in rural areas. Rural communities are often isolated and, especially in the western U.S., located many miles from urban areas. The definition of rural, as used in this paper and as stated by the Center for the Study of Rural Librarianship, refers to a population of 25,000 or less. Approximately 80 million people live in rural areas in the United States. Rurality often evokes images of farmland, but this is statistically no longer the case (Wilkinson, 1991, p. 5). Less than 3 percent of the rural population is currently engaged in farming. Also, the traditional "extractive" industries–mining, forestry, fisheries–employ only 9% of rural workers (Wilkinson, 1991, p. 6). The biggest areas of employment are services, manufacturing, and retail trade. Unemployment is high in rural areas, however, and concomitantly, rural poverty is prevalent.

The distance and isolation along with crumbling or inadequate infrastructure (poorly maintained roads, antiquated phone and telecommunications equipment, for example) are just a sampling of the difficulties and impediments to disseminating health information to rural residents and rural health practitioners. This paper will document some successful outreach programs and other methods of allowing rural communities to procure topical medical and health information. The crucial role of the medical library as a link between the rural community and health information will be examined.

The vast distances of the West and the scattered, small communities have prompted several innovative methods to overcome the drawbacks of such distances. One such solution, developed by Eastern Oregon State College (ESOC), is simultaneous remote searching (SRS). Many rural physicians and health educators do not have access to online bibliographic databases, such as

Medline, and SRS provides a way to combat this access problem. SRS can overcome geographic barriers to create new methods of communication using the telephone system. SRS involves the connection of terminals so that information transmitted to or from a database by one terminal can be simultaneously transmitted to a second terminal at a remote location (Ferguson, 1987, p. 68).

Here are the steps a rural health worker would follow to access the ESOC SRS system (Anderson, 1987, p. 68):

1. The health practitioner contacts the search center via the telephone. The reference librarian at the search center conducts a reference interview to elicit the type and scope of medical information needed.

2. After conducting the interview, the searcher develops an appropriate search strategy. Then, the searcher links the master terminal to the satellite terminal at the remote patron's location, and also connects the master terminal to the computer with the database to be searched.

3. The search is conducted, with the searcher transferring control of the key board to the health practitioner for comments and suggestions. Librarian/patron interaction is maintained as the end-user communicates with the searcher via the computer terminal. The search can instantly be refined to obtain the appropriate information. Both parties receive identical copies of all interactions with the database and all citations generated by the search.

4. Abstracts can also be provided instantly. The health worker can be faxed the materials immediately, or it can be sent though the normal interlibrary loan channels.

This reference network, available throughout eastern Oregon, allows health worker to "watch over the shoulder" of the librarian as he/she conducts the search, and thus the patron can make suggestions for modifications during the search. This system allows rural residents to increase their access to information through the provision of database searching and immediate document delivery.

Anderson cites an example of how a doctor used the SRS system to his--and his patient's--advantage: Wallowa Memorial Hospital is located in Enterprise, OR--a remote community of 2,500 people. A Staff member at the hospital phoned the ESOC SRS and said that a doctor was on his way to deliver twins, which he had never done before. The doctor had requested information via telephone from his office, before leaving for the hospital in regard to specific problems he might anticipate with delivering twins. By the time the doctor arrived at the hospital fifteen minutes later, there were 26 article citations with abstracts waiting for him. The twins, both boys, arrived safely (Anderson 1987, p. 68-69).

While SRS was developed and implemented in eastern Oregon, a similar system could be utilized in any rural areas to overcome isolation and distance. A big advantage, too, is that a trained researcher and not the end-user conducts the search, ensuring appropriate data will be obtained.

Montana, a predominantly rural state with great distances between urban areas, decided to use fax machine to overcome these problems. Linda Brander, Project Manager for the Montana Faxnet Project based on the State Law Library of Montana in Helena, writes that "our solution to these problems was to design a communication system to provide connections to state and national networks, to develop an effective system for statewide cooperation and coordination of services that would increase the visibility of libraries within local communities" (Brander, 1987, p. 71).

Medical libraries could form a fax network patterned after Montana's Faxnet. This project distributed 13 fax machines throughout the state, as well as one at the state Capitol's information desk in Helena for the public to use and become familiar with. Within a three month period, 1,500 pages of information were sent and received by the statewide network.

The Montana Faxnet Project was aggressively marketed and promoted throughout the state. Brander feels that often libraries are not seen as information brokers, but that through marketing and promoting their services, libraries will receive the high visibility that they deserve for delivering important services and information (Brander, 1987, p. 71). Thus, Faxnet articles appeared in newspapers, presentations were made to legislators and to individuals

within communities, fact sheets were distributed to registered lobbyists, brochures describing the program were developed, workshops were planned to familiarize potential and current users, and a slide show was being developed. Marketing and promoting available services is a crucial step for any type of information outreach program in order to reach as wide and varied a clientele as possible, and as Brander state–to enhance the status of librarians as competent and efficient information brokers.

Another outreach program designed specifically for the medical field is INFONET, which was developed at the Oregon Health Sciences University. The objectives of INFONET are to "coordinate a number of information resources, to provide access from a user's home or place of work; and to make the mechanics of access relatively transparent. The remote end user can access the pooled resources of several libraries" (Johnson, 1987, p. 75).

INFONET is based on the traditional interlibrary loan system, but has expanded to include a union database of all the serial holdings of all the medical libraries participating in the network. INFONET also uses electronic mail (email) to supplement its communications network. The database used by OHSU Serline–an union serials database from the National Library of Medicine (NLM) A "bridge" was also constructed to link INFONET with Docline, the interlibrary loan system from NLM. Daily a microcomputer dials into the INFONET computer. After downloading all of the appropriate transactions, a program re-formats the transactions into the format expected by Docline. The microcomputer then dials Docline and uploads the transactions (Johnson, 1987, p. 77). Thus, the libraries have access to a wide range of resources with document delivery through the already established ILL system. this network probably could be updated by using FAX machines to send documents needed immediately.

An interesting and unique response to rural isolation, rugged terrain, and often inhospitable weather, was the outreach program developed in Alaska at the University of Alaska-Fairbanks. Traditional methods of document delivery were too slow and unpredictable (bad weather can hamper deliveries), so the Alaska Teletext Project (AMPI-Eskimo for "hurry up!") was developed to deliver information without relying on ground transportation.

AMPI utilizes the unused portion of a television channel to insert information in a digital format. Decoder/receivers at local sites pull the information off the television signal and load it into microcomputers. "Data broadcasting allows inexpensive delivery of large amounts of information. Data can be delivered via a television signal to a single site, to all sites, or any subgroup of sites throughout Alaska. Information can also be sent over existing computer networks"(Smith, S. 1987, p. 85).

Of course, the information is sent in electronic form and this requires that traditional sources of information such as books and articles, must be converted to a digital format.

The AMPI network chose to use a conversion system called optical character recognition. Character recognition converts text and numbers, but not graphic material. Therefore you can't convert maps, photographs, or scientific notations. (Since this project was implemented, character recognition systems have developed the capacity to handle graphics). The system converts text into ASCII (American Standard Code for Information Interchange) characters. ASCII is fast becoming a universal computer code and virtually all microcomputers accept and understand ASCII files (Smith, S. 1987, p. 86). ASCII transmission is extremely rapid–documents take only a few seconds to send.

AMPI wanted to avoid the telecommunications charges that are incurred with normal long-distance telephone delivery of information. Therefore the phone system was bypassed in favor of television signals. By inserting digital data into the unused portion of a television signal (on the vertical blanking unit–this does not affect or interfere with normal television program viewing), using special receiver/decoders at each local site to pull the data from the broadcast signal and then outputs it to any computer, terminal or printer that can accept standard asynchronous data. Therefore, anyone with a microcomputer in the television viewing area can grab the data and store it on a microcomputer. Steve Smith, manager of the Alaska Telenet Project, quips that "as you watch MasterPiece Theatre, your microcomputer "watches" for data it can retrieve" (Smith, S. 1987, p. 87).

The biggest drawback to this system is that it is not interactive–it is one-way communication. The individual sites can't communicate with each other or the central sending site. Also, data delivery is limited to the broadcast range of the television signal, and any interference with the signal also interferes with data reception.

Again, medical libraries could utilize a similar system to rapidly transmit medical information to remote areas. All types of libraries, as well as other community organizations such as cooperative extension , and schools involved in long-distance education could form such an information network to share resources. The Alaska Teletext Network uses and adapts to existing systems, thus avoiding the costs involved in creating a new method of data delivery, and any library wanting to form a network should consider using such a system.

Medical libraries should also try to become part of an AHEC–Area Health Education Center–network in their region. AHECs are a nationwide network of school and community partnerships engaged in planning and implementing educational activities reflecting a wide variety of health care needs. AHECS are an attempt to alleviate the maldistribution of health practitioners (who are concentrated in urban areas) by increasing rural networks and by creating easier avenues for accessing information.

The University of California's Central San Joaquin Valley Area Health Education Center has a Biomedical Library Program (BLP). The objectives of the BLP are to improve library services in hospitals and other medical institutions in the region and to foster cooperation and coordination in the future development of these services. Some of the major programs and services provided by the Biomedical Library Program include "consultation concerning the administration and operation of health-related libraries, the training of biomedical personnel, the sponsoring of workshops, membership in a number of biomedical information networks, access to biomedical information services such as Medline and Biosis, and the provision of information on federal grants to assist individual libraries in collection and services development" (Jordan, 1979).

Another successful outreach program is the University of New Mexico's Medical Center Library's Health Information Services Outreach Program. New Mexico has a largely rural population, separated by rugged terrain and often extreme weather. This statewide program was begun in 1980, and it was designed to meet the health and information needs of rural residents. Susan Chamberlin, who wrote about the project, states that "most traditional library-based consumer health information services reach only those segments of the general population already motivated to either change or improve their health habits; who know how and where to go for health information materials, and who in general come from a relatively stable environment where information seeking skills exist (Chamberlin, 1982, p. 49). Therefore, the New Mexico Medical Center library's approach was to "not stress direct consumer contact and service, but strive to support health promotion and disease prevention efforts by enhancing the resources and skills of those directly responsible for consumer health education" (Chamberlin, 1982, p. 49).

Instead of attempting to reinvent the wheel, this project worked with already existing networks and cooperations within the New Mexico health care system, but also included public libraries and consumer groups. Some of the groups and agencies involved included the State Medical Society, the Navajo Area Indian Health Service, the Improved Pregnancy Outcome Project, the New Mexico Drug Information Center, community libraries, and other organizations (Chamberlin, 1982, p. 1). The author also recommends forming liaisons with the voluntary health agencies in your area such as the American Cancer Society, American Heart Association, American Lung Association, etc., to implement resource sharing and to coordinate activities (Chamberlin, 1982, p. 18).

The New Mexico Outreach Program created several projects and methods to disseminate medical information to rural areas. These included Health Information Workshops that brought together health educators, practitioners, consumers, and librarians. These workshops provided a forum for communication among diverse agencies and individuals, and provided an opportunity for the medical library to market and promote their services. One idea resulting from these meetings was audio-visual (AV) educational packages

which could be sent to rural areas statewide or accompany rural health educators on their "rounds." Bookmobilists, or "wandering information minstrels" as Chamberlin calls them, were also part of the outreach project. Core collections about different health topics were put aboard the bookmobiles and traveled to rural areas with no other library service and limited health service. A Books by Mail program was established as well in an effort to provide blanket coverage to all areas. The topics that public libraries were most frequently asked to provide information on were pregnancy, nutrition/diet, and specific diseases, so the core collections concentrated on these areas.

Chamberlin writes that "fully aware that libraries are often regarded as repositories for information rather than active promoters of its use, we set out to prove our effectiveness by marketing the information." (Chamberlin, 1982, p. 18). So pamphlets, bibliographies, brochures, and posters as well as newspaper and TV ad were developed to help promote the Outreach Program and its services.

The National Library of Medicine (NLM), the world's largest medical research library with a collection of over 4.5 million items, has been fostering medical networks for many years, almost since its beginning in 1836 (Smith, K. 1986, p. 17). But it wasn't until computer databases became available, that NLM became easily accessible to both urban and rural health practitioners. Medlars (Medical Literature Analysis and Retrieval System) started up in 1964, and was the NLM's first online bibliographic database. Medlars now consists of several databases of which MEDLINE is the most well known. MEDLINE covers over twenty five years (it was established in 1971 but contains references back to 1966) and indexes over 3,000 journals and includes over 7 million citations. In 1990, 4.8 million searches were performed. It contains *Index Medicus, International Nursing Index,* and *Index to Dental Literature,* MeSh (Medical Subject Headings), NLM's 15,000 term medical language thesaurus, is used to index the articles. NLM also has specialized databases available through Medlars in the fields of Health Administration, Toxicology, Cancer, Population Studies, Medical Ethics to name a few. The rural hospital library and/or the rural health practitioner can request information on a wide variety of subjects, and NLM will mail the journal articles through their Docline ILL system (they charge a fee

of $8.00 for their ILL service). All that is needed to tap into MEDLINE is a terminal or microcomputer with telecommunications software, a modem, a telephone line, and a printer. MEDLARS and its associated databases is available 24 hours a day. Searchers pay only for the actual cost of searching the databases ($36/hour for Medline) plus telecommunications charges. NLM sponsors one-day "Health Professional Training Courses" that teach the basics of database searching, as well as a free 3 to 5 day MEDLINE Initial Training Course.

Another service offered by NLM is the delightfully named Grateful Med. This is a microcomputer-based software package developed in 1986. It can be used on both IBM PC or compatible personal computers (Version 5.0 released in March 1990 and Version 6.0 for IBM PC released in Spring of 1992), and on Apple MacIntosh computers (Version 1.5, released in April 1991). This user friendly set-up uses a menu-driven system that is easy for untrained searchers to navigate. It utilizes both natural language, and an on-screen thesaurus containing MeSH headings can be used to select search terms. After the search term is entered, the Grateful Med program calls up the NLM computer, logs on with the user's code and password, conducts the search online, then logs off NLM's computer. The search results are automatically downloaded to the searcher's computer disk. Abstracts are available with 65% of MEDLINE citations. The cost per hour of searching is $36.00, and the software package costs approximately $35.00.

Another NLM service with an equally catchy name is Loansome Doc, the document ordering feature of Grateful Med. This service enables the health practitioner or librarian to obtain full text articles for the citations retrieved while searching Grateful Med. The articles are FAXed or mailed from the nearest regional medical library participating in the network, or if not available locally, from NLM. Loansome Doc is tied in with Docline, NLM's national automated interlibrary loan request and referral document delivery system. The Loansome Doc program automatically enters the user's request into the Docline system. In an emergency situation, the doctor or librarian can run a search on Grateful Med to obtain the needed citations, enter a request for the full-text articles on Loansome Doc, and then, in order to receive an immediate

response, the searcher can follow up with a phone call to the regional medical library receiving the ILL request to ask that the material be FAXed immediately.

This excellent system allows even remote areas access to information quickly. It allows isolated rural doctors and health personnel to obtain up-to-date material, thus breaking down those geographical and distance barriers that in the past prevented or inhibited information access.

The nationwide network of medical libraries established in 1967 by NLM was known as the Regional Medical Library Network. It is now called the National Network of Libraries of Medicine (NN/LM). A total of 4,000 medical libraries (in hospitals), 125 Resource Libraries (at medical schools), and eight regional libraries across the country are members of this network. The eight regional medical libraries and the areas they serve are:

1. Middle Atlantic Region, *NY Academy of Medicine*

   States served: DE, NJ, NY, PA,

   Online Center for Regions 1,2,8

2. Southeastern/Atlantic Region, *U. of Maryland/Baltimore Health Sciences Library*

   States Served: AL, FL, GA, MD, MS, NC, SC, TN, VA, WV, DC, PR, VI

3. Greater Midwest Region *U. Of Illinois/Chicago Library of the Health Sciences*

   States Served: IA, IL, IN, KY, MI, MN, ND, SD, OH, WI

4. Midcontinental Region

   States served: CO, KN, MO, NE, VT, WY

   Online Center for Regions 3,4,5

5. South Central Region

   States Served: AR, LA, NM, OR, TX

6. Pacific Northwest Region

   States served: AK, ID, MN, OR, WA

7. Pacific Southwest Region

States served: AZ, CA, HI, NE, US Pacific Territories

Online Center for Regions 6 & 7

8. New England Region

    States served: CT, ME, MA, NH, RI, VT

The goals and objectives of NN/LM, a cornerstone of NLM's outreach efforts, are to:

- improve access to and delivery of information to health profession-als

- maintain an effective and efficient network of health sciences libraries

- develop and maintain linkages between the Network and other library/information network or health professional organizations to share resources

The network handles over 2 million interlibrary loan requests each year. NN/LM also answers or refers reference questions and will perform online searches for health workers.

Rural medical librarians should also be aware of the grant programs (called Extramural Programs) available from the NLM. The grants offer assistance for library resources, research in biomedical communications, biomedical publications, information access and other areas.

Another valuable source of information concerning the field of rural health is the USDA National Agricultural Library's Rural Information Center (RIC), located in Bethesda, Maryland. RIC began in 1987, and it deals with all aspects of rural development, but the bulk of the questions it receives–39%–are in health-related (John, 1992). Most of these questions are directed to the information specialists at the Rural Information Center Health Service (RICHS), located within RIC. RICHS is "designed to be a national clearinghouse for collecting and disseminating information on rural health issues, research findings related to rural health, and innovative approaches to the delivery of rural health care services" (USDA, 1990).

Some of the services available include assistance with grant proposals, locating funding sources, database searches, bibliographies, statistics on rural health, referrals to organizations or experts in the field, and document delivery (ILL). RIC now has a toll-free telephone number making it very easy to access these services. Currently, there is no charge for any of the services mentioned.

Another new technology recently reviewed in *Time* and of importance to rural health practitioners involves videophones and satellite linkups—a system called "telemedicine" (Purvis, 1992, p. 68) According to *Time*, "in the past two years two-way video telemedicine projects have been launched in Texas, Georgia and West Virginia" and these physicians "in medically underserved areas use ordinary telephone lines to consult with highly trained specialists...." (Purvis, 1992, p. 68). Using digital signal compression, a technique developed in the 1980s, the data-carrying capacity of phone lines can be increased 30-fold (Purvis, 1992, p. 68).

Thus, "specialists in radiology, cardiology, and neonatology, whose high-priced services are in great demand in rural areas, have been quick to take advantage of the new technology. These doctors do much of their diagnosing with tests such as echo cardiograms, CAT scan and fetal monitoring, which can be displayed electronically and sent over the wires with ease" (Purvis, 1992, p. 68).

Although still very expensive (approximately $500,000), this system could provide continuing education for the rural health practitioner, provide expert assistance that is often unavailable in rural areas, and overcome isolation. Medical libraries, in the future, may also be able to utilize this new technology to rapidly transmit information and provide yet another link between rural residents and medical information.

The importance of the information provided to health workers by medical libraries should not be downplayed. In a recent study of 208 physicians in upstate New York, "80% said information provided by medical libraries led them to handle some aspect of the care of their patients differently than they would have otherwise" (Quinn, 1991, p. 12). Nineteen percent said "that library information contributed to their ability to avoid patient mortality." (Quinn,

1991, p. 12) The study was undertaken by Joanne G. Marshall from the University of Toronto's Faculty of Library and Information Sciences in an effort to provide data showing the need for the reinstatement of the U.S. Government's regulation that requires hospitals to maintain a medical library to be eligible for Medicare and Medicaid funding. Again, situations such as this demonstrate that librarians must begin to actively promote and market their information services.

In conclusion, medical libraries can and do play an important role in the rural community. Certain characteristics of rural areas, however, make them susceptible to a paucity of current, timely medical and health information. These characteristics include a dispersed population, an aging population, high unemployment, low income, hazardous occupations, low educational levels, poorly maintained infrastructure and a conservativeness that resists rapid change. These are some of the obstacles to disseminating health information that medical libraries and health practitioners face. However, as the outreach programs delineated in this paper have demonstrated, it is possible to successfully overcome these barriers by using new technologies, creating networks, and marketing the library's services.

Appendix

National Library of Medicine
8600 Rockville Pike
Bethesda, MD 20894

MEDLARS Services (Including Grateful Med)
(800) 638-8480

Public Information
(800) 272-4787

For Information about Regional Medical Libraries
(800) 338-7657

For Information on External (Grant) Programs
(301) 496-4221

Rural Information Center (RIC)
National Agricultural Library
Room 304
Beltsville, MD 20705
(800) 633-7701
(301) 504-5547

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