The Nation's Health Information Network: History of the Regional Medical Library Program, 1965–1985

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INTRODUCTION

THE MOTIVATION to write this history of the Regional Medical Library Program (RMLP) arose when participating in the development of a chapter on library cooperation for the *Handbook of Medical Library Practice* [1]. Very few published accounts of this premiere library network existed; it was therefore necessary to rely on my memory of events and to seek out unpublished reports and news releases. The Regional Medical Library (RML) network has been in operation for twenty years, and many health sciences librarians today perhaps take for granted the structure which has improved the delivery of information to health professionals and introduced technological developments in the practice of health sciences librarianship. New participants in the operation and management of the RML network are also sometimes unaware of services and programs which were tried before. Documentation of the evolution of the network will serve to assist those involved in its management, as well as those interested in what has made this network so successful.

The organization of twenty years of historical information presented a considerable challenge. One approach could have been to discuss each program or service (e.g., interlibrary loans) in its entirety. The evolution of programs and services was, however, frequently affected by budgetary and/or policy considerations which were best presented in a chronological format. The final arrangement is a compromise between the strictly chronological and the programmatic approach. The history is divided into four major periods: the events leading to the creation of the network (prior to 1965), the design and establishment of the original network (1965–1970), the operation of the original network (1971–1981), and the reconfigured network (1982–1985).

The Nation's Health Information Network: History of the Regional Medical Library Program, 1965-1985 is a historical review of the evolution of the network including the National Library of Medicine's administration of the program, the organizational structure of the network and its regions, the programs and services provided by each region, and an evaluation of the Regional Medical Library Program's accomplishments and impact. Information for this history came primarily from the published literature including individual RML newsletters, official reports and minutes, and interviews with key participants in the development and operation of the network. It was not possible to chronicle each region's operation and accomplishments in detail, nor credit the contributions of individual RML staff. Such descriptions are best presented in individual histories, an activity I encourage my colleagues to undertake.

It is also difficult to adequately describe the significant contributions made by many individuals and institutions to the RML network. Most notable are the efforts of the staff in medical school and hospital libraries in each region. They have given of their time, providing valuable advice and assistance to the operation of the network; shared their institution's resources; and adapted to change in a way that assured the continued viability of the network. For every federal dollar spent on the provision of RML services, several local dollars were expended through in-kind contributions. Health sciences libraries have enthusiastically accepted the important responsibility ascribed to them in the President's Commission Report in 1965: "The medical library thus serves medicine as a guarantor of the organization of its scientific and professional knowledge, and of accessibility to what is already known" [2:38].

BACKGROUND AND NEED FOR A REGIONAL MEDICAL LIBRARY (RML) NETWORK

In the period following World War II, the provision of biomedical information to the United States

health care community was significantly and adversely affected by the lamentable condition of the nation's health sciences libraries. The inadequacy resulted primarily from the fact that, while funding for medical research and education had increased dramatically during this period, funding for libraries had failed to keep pace. The National Library of Medicine (NLM) and the health sciences library community were keenly aware of these deficiencies, and undertook a concerted effort to improve both health sciences libraries and access to health information.

The NLM, which became administratively part of the Public Health Service in 1956, was most interested in receiving authority to award grants for the improvement of biomedical information delivery. Such a plan was discussed by the NLM Board of Regents in 1960, and in the summer of that year Frank B. Rogers, M.D., director, investigated whether the Public Health Service Act permitted NLM to make grant awards. Although authority was not to be forthcoming until 1964, Dr. Rogers immediately began preparing for the eventuality. In 1960 he appointed Scott Adams as his deputy for "extramural" activities, and assigned Estelle Brodman, Ph.D., as Adams' associate. Together, Mr. Adams and Dr. Brodman gathered information on the need for extramural support programs, and drafted plans for such programs. One of their more significant actions was to contract with Harold Bloomquist, assistant librarian of the Harvard University Schools of Medicine and Public Health, to conduct a study on the condition of medical school libraries in the United States [3:395–6].

Bloomquist's study resulted in a landmark paper which clearly documented the poor condition of medical school libraries and their inability to provide even the most basic of services. He warned that since medical school libraries were not able to provide information effectively to their users, scientists were forced "...to seek other ways by which to satisfy their information needs" [4:158]. Bloomquist also suggested that one way to control

> ... the great need for physical expansion of libraries is the development of the regional reservoir library. In this scheme there is ... a large central resource library which bears the responsibility for collecting materials in depth and which makes its resources and services available to a broad geographic area...[4:152].

Bloomquist recommended that federal funds be made available to: improve medical school library collections, facilities, and services; train medical librarians; include library support in ongoing research program funding; support bibliographic control of the scientific literature; and establish "A system of regional reservoir libraries...encouraged and supported by the National Library of Medicine through the granting of funds..."[4:162]. The results of the Bloomquist study were widely discussed, and NLM advised the health sciences community and appropriate federal officials of their desire to implement an extramural program to assist medical libraries [5:26–7].

The concept of regional medical libraries generated a great deal of interest among librarians, physicians, and federal officials. In early 1963 an informal meeting was convened at the Harvard Medical School to explore the possible elements of such a network. Eleven medical school librarians met with representatives from NLM and the National Institutes of Health to present six model regional plans. The plans varied considerably; some proposed regional services for large geographic areas encompassing several states, while others limited services to a few counties or one state. All of the plans described extensions of existing cooperative services provided by medical libraries, and noted that expanded and improved service would be feasible only if outside financial support were available [6].

In early 1964 President Lyndon B. Johnson appointed the President's Commission on Heart Disease, Cancer and Stroke, chaired by Michael E. DeBakey, M.D. The commission was appointed to develop a "battle plan" for the defeat of these three diseases. In noting the importance of communicating to practicing health professionals the results of scientific research in the conquest of disease, the commission cited the poor condition of the nation's medical libraries and stated that "...unless major attention is directed to improvement of our national medical library base, the continued and accelerated generation of scientific knowledge will become increasingly an exercise in futility" [2:25].

The commission recommended "...that the National Library of Medicine be authorized and adequately supported to serve its logical and necessary function as the primary source for strengthening the nation's medical library system" [2:64]. The background material supporting this recommendation requested funds for NLM to conduct research on and develop new methods for the efficient management and dissemination of biomedical information and to provide grants to support improved medical libraries; and recommended legislation to allow NLM to assist medical

libraries. A national medical library network was proposed to capitalize on existing cooperative arrangements, and to provide equal access to health information to health professionals across the nation.

Martin M. Cummings, M.D., appointed director of NLM in January 1964, was keenly interested in a grants program for NLM, and discussed such a concept with Senator Lister Hill of Alabama. Senator Hill encouraged NLM to draft specifications for legislation, a task which Dr. Cummings readily accepted and assigned to Marjorie Wilson, M.D., the newly appointed head of the Extramural Programs (EMP) section of NLM. In drafting the bill, Dr. Wilson utilized the background and support information provided by the Bloomquist and President's Commission reports, and the results of NLM-sponsored studies conducted by the Association of American Medical Colleges (AAMC) and the Medical Library Association (MLA) on the needs of medical school libraries [7,8].

Throughout 1964 and 1965 there was wide discussion about the programs which comprised the proposed legislation. At the October 1964 AAMC annual meeting, Drs. Wilson and Cummings presented a paper on NLM's relationships to medical education and research. The idea of a network of regional libraries was advanced. Research would need to be conducted into the design of such a network, but Wilson and Cummings postulated that should a network be "...fully developed, it seems prudent to place such resources wherever possible in existing private, university, or free-standing libraries of excellence" [9:231]. Dr. Cummings provided additional insight into the need for a medical library network at the dedication of the Francis A. Countway Library, Harvard University, in 1965:

> Continued dependency of the more than 6,000 medical libraries upon the services of the National Library of Medicine would lead ultimately to the evolution of a monolithic medical resource in this nation. Our country requires the development of a complex of regional medical libraries with adequate facilities, resources, and personnel to serve those sections of the nation with underdeveloped library facilities [10:161].

The medical library community was interested in the relationship between the proposed RML network and NLM's plans to decentralize MEDLARS (Medical Literature Analysis and Retrieval System) search centers. MEDLARS, developed by NLM to produce its major listing of the medical periodical literature, *Index Medicus*, via computer, could also be used to provide computer produced lists of citations on specific topics for individuals. Adams clarified the relationship by stating:

> The selection of a library as a MEDLARS search center is not predicated on a willingness to provide regional library service as a unit of a national network. There are many unknown factors in the design of a national medical library network...and NLM hopes to support studies in this area....It is difficult to conceive of regional libraries...without MEDLARS search capability; on the other hand, local MEDLARS search centers...can be established without prejudice to the design of a system of regional medical libraries [11:148].

The legislation drafted by NLM, entitled the Medical Library Assistance Act (MLAA), was introduced by Senator Hill on January 19, 1965; an identical bill was introduced by Representative John Fogarty in the House. The MLAA was signed by President Johnson on October 22, 1965. The expeditious passage of this act was due in large part to the strong support it received from the health and library professions [3:397–9].

Medical Library Assistance Act

The Medical Library Assistance Act of 1965 (MLAA), Public Law 89-291, authorized NLM to provide grant funding in seven program areas: (1) construction of new, and renovation, expansion, or rehabilitation of existing medical library facilities; (2) training of medical librarians and other information specialists in the health sciences; (3) assistance to special scientific projects; (4) research in the field of medical library science and related fields; (5) improvement and expansion of the basic resources of medical libraries and related facilities; (6) development of a national system of regional medical libraries; and (7) preparation of biomedical scientific publications. The MLAA specified that the NLM Board of Regents would serve as the National Medical Libraries Assistance Advisory Board to advise on regulations and policy for the administration of the Act and to review and approve awards.

Of most concern, for the purposes of this history is Section 398 of the MLAA which authorized the establishment of the Regional Medical Library (RML) network. It should be recognized, however, that much of the work of the RMLs was greatly facilitated by other provisions of the act, especially those programs which provided support directly to medical libraries.

Section 398 of the MLAA provided that grants could be made to existing public or private nonprofit medical libraries to enable them to serve as RMLs for a geographic area. Grant funds could be

used for (1) acquisition of books, journals, and other similar materials; (2) cataloging, binding, and other processing procedures; (3) acquisition of duplicating devices and other equipment to facilitate the use of the library's resources; (4) acquisition of mechanisms and employment of personnel for the speedy transmission of materials from the RML; and (5) construction or renovation of physical facilities necessary in order to function as an RML. Section 398 also provided NLM with authorization to establish regional branches of NLM in any geographic area of the United States which needed an RML, but in which there was no library which could serve as or be developed into an RML.

The appropriation authorization for the RMLP was not to exceed $2,500,000 for each of the five years beginning with the fiscal year ending June 30, 1966, through the fiscal year ending June 30, 1970 [12]. As can be seen in Table 1, the largest amount of funds obligated by NLM to the RML network during this period was $2,088,000 in 1969.

TABLE 1

MEDICAL LIBRARY ASSISTANCE ACT BUDGET HISTORY 1966–1986

Fiscal Year	Authorization	Appropriation	Obligation to RMLP
1966	$11,000,000	$ 5,010,000	—
1967	21,000,000	13,800,000	$ 105,000
1968	21,000,000	11,250,000	680,000
1969	21,000,000	5,789,000	2,088,000
1970	21,000,000	5,452,000	1,807,000
1971	23,500,000	5,992,000	2,128,192
1972	25,500,000	6,892,000	2,093,000
1973	27,500,000	8,492,000	2,179,808
1974	8,442,000	7,029,000	2,658,000
1975	17,500,000	6,682,000	2,194,000
1976	20,000,000	6,433,000	3,351,000
1977	20,000,000	8,000,000	3,086,000
1978	14,600,000	7,987,000[1]	3,020,000
1979	15,000,000	7,987,000[1]	2,848,000
1980	16,500,000	9,925,000	2,967,000
1981	18,500,000	9,831,000	2,999,000
1982	7,500,000	7,500,000[2]	2,399,000
1983	—	7,500,000[2]	2,300,000
1984	—	7,500,000[2]	2,000,000
1985	—	7,790,000[3]	2,000,000
1986	11,000,000	—	2,300,000

[1]Excludes one million dollars reprogrammed from NLM intramural activities.
[2]Continuing Resolutions.
[3]Authorizing legislation expired Sept. 30, 1982. Authorization for FY 1985 is contained in the Appropriation and Continuing Resolution.

In 1970, Public Law 91-212, a three-year extension of the MLAA of 1965, was passed by Congress. Two modifications were made to the section of the law dealing the RMLP. NLM was authorized to use a contract mechanism, in addition to grants, to fund the RMLs, and the RMLs could use either grant or contract funds for planning. The authorization levels remained the same [13].

Public Law 93-45, the Health Programs Extension Act of 1973, extended for one year six of the seven program authorities in the MLAA, deleting construction authority with a corresponding modification in appropriation authorizations. The authorization for regional medical libraries was raised to $2,902,000 [14].

The Health Services Research, Health Statistics, and Medical Libraries Act of 1974, Public Law 93-353, extended the MLAA through June 30, 1977. The new version of the MLAA included all changes recorded in the 1970 and 1973 extensions, and consolidated the authorization appropriations for the six programs into one sum [15].

Between 1977 and 1982 the MLAA was extended three times, without any changes in program authorizations. Public Law 95-83, the Biomedical Research Extension Act of 1977, extended the authorization through September 30, 1978; Public Law 95-622, the Biomedical Research Extension Amendments of 1978, provided authority through September 30, 1981; and Public Law 97-35, Omnibus Budget, extended funding through September 30, 1982.

From 1982 to 1985 several unsuccessful attempts were made to extend the MLAA for three years and increase the funding level for the programs. However, all MLAA programs were funded during this period under various budget continuing resolutions.

In 1985, Public Law 99-158, the Health Research Extension Act, was passed, extending the MLAA through September 30, 1988, at increased authorization levels. In addition to the changes described earlier, several differences between the description of the Regional Medical Library Program in Section 398 of the 1965 law and Section 475 of the 1985 law can be noted. In keeping with the deletion of construction authorities in the MLAA, RMLs are no longer permitted to use grant or contract funding for construction and renovation of their physical facilities. In addition to agreeing to modify and increase their own library resources, RMLs are asked to "..supplement the resources of cooperating libraries in the region..." [16].

The 1965 authorization language for the RMLP has proven to be extremely flexible and enduring, requiring only minor modifications. Unfortunately, as illustrated in Table 1, the actual appropriations for the MLAA programs, including the RMLP, have never equaled the authorizations. The impact of the funding available for the RMLP is noted in the description of the development and evolution of the RMLP which follows.

Design of the Regional Medical Library Network

Once funding for the RMLP was assured, NLM undertook to define in more detail the structure and function of the network. Several important questions were raised. Would the RMLs be newly established libraries? How many regions, composed of which states, would be established? What would be NLM's role in the design and operation of the network?

NLM's Preliminary Design

One of the earliest public descriptions of a preliminary concept of the RML network was in November 1965, when Dr. Cummings presented a paper at an institute on information retrieval at the University of Minnesota. He stated that "...the National Library of Medicine believes that any national system should build upon existing resources, utilizing new techniques and equipment wherever possible to improve the flow of information throughout the network" [17:175]. The system would serve both libraries and subject-oriented groups.

Cummings described three major components of the system: centralized coordination of the network, geographic dissemination of information, and mission-oriented dissemination of information (e.g., information packaged for a group, generally working in a specific subject area such as vision research). NLM would be responsible for the centralized coordination including planning, selection of RMLs, and network coordination, and would continue to collect, process, and make available the world's biomedical literature. The RMLs would receive federal support to assume the responsibility for the geographic dissemination of published information. Dissemination included: (1) the conduct of literature searches by computer; (2) generation of computer current-awareness listings; (3) the provision of copies of documents; (4) the provision of reference services; (5) the conduct of training and orientation programs for medical library staff; and (6) support for specialized information centers. In order to serve mission-oriented special interest groups in the health sciences, bibliographic information would be repackaged for their use. Figure 1 illustrates NLM's preliminary plan for the RML network [17].

Herner Design Proposal

Although passage of the MLAA was a relatively smooth and uncomplicated process, implementation was not. Upon review of the programs authorized by the MLAA, the Bureau of the Budget felt that a clearer picture of the future course of biomedical libraries in light of technological advances needed to be developed. The bureau requested that funding for the construction of medical libraries be delayed until 1967, and asked the Office of Science and Technology to implement a study of future biomedical library needs. A contract to conduct the study was let to Herner and Company via the National Science Foundation [18:7].

The introduction to the Herner preliminary report, issued in February 1966, stated that the study was performed "for the purpose of determining an optimal configuration for a national network of medical libraries in the United States, and effective means of implementing it" [19:1]. The network as described by Herner called for four types of library units. The "central unit" would collect and disseminate the world's biomedical literature; NLM would serve in this capacity. "Local units" would participate in the network and provide for the information needs of their primary clientele, about 2,000 users each. "Special units" were described as libraries containing extensive collections in narrow subject fields. "Interlibrary units" would serve as depositories for older or little-used materials from the local units. This proposed network was very expensive, since it called for the construction of a fair number of library facilities. The projected costs over a six-year period were $313,641,000. Another key recommendation was that planning and administration of the network be handled by the Committee on Scientific and Technical Information or the Office of the Surgeon General and that it not involve NLM [19].

The Herner report was not well received by NLM or the medical library community. In a presentation at an invitational conference on RML service in the Pacific Northwest, Dr. Cummings stated: "I want to say that I think it's a poor study. It makes projections which I believe would be wasteful of federal funds and critical manpower. I

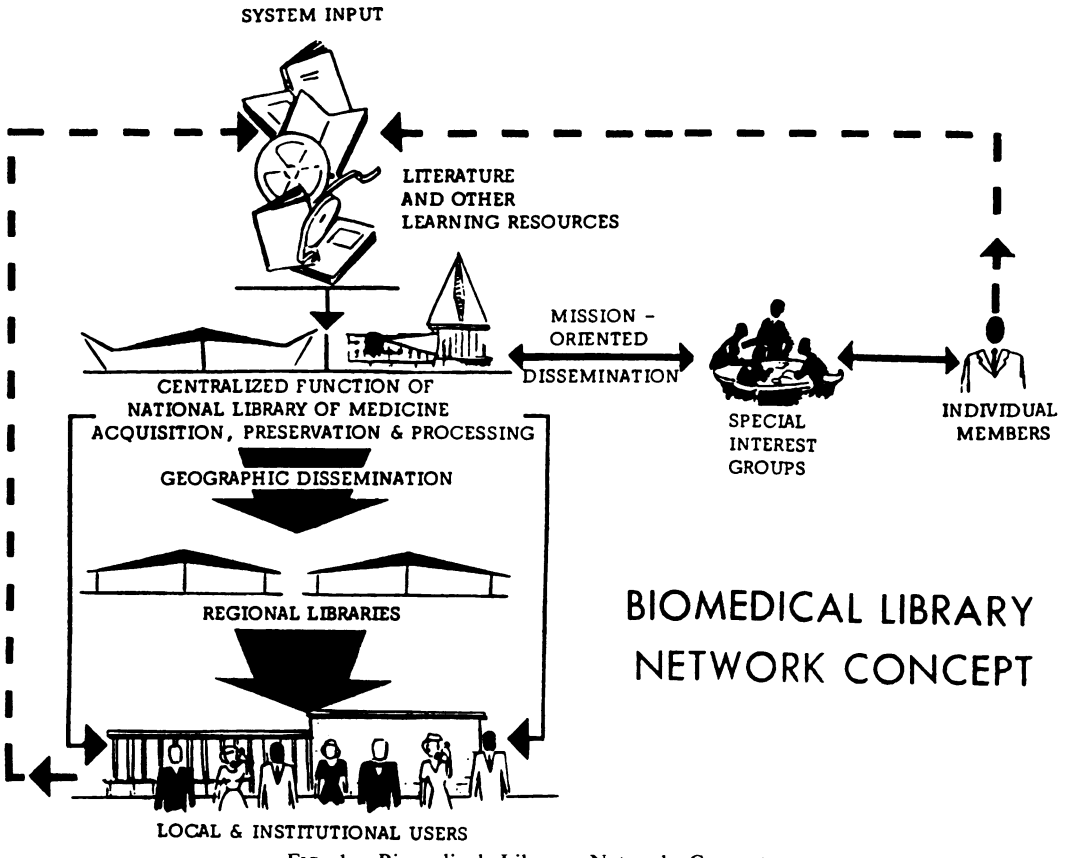


FIG. 1.—Biomedical Library Network Concept.

Source: Oppenheimer GJ. Regional medical library service in the Pacific Northwest. Proceedings of an invitational conference, May 12–13, 1966. Seattle: University of Washington, 1967:144. Reprinted with permission.

think the library community is betrayed by the projection of funds that would be made available to you, but more importantly, I think the health community is betrayed by some of the concepts which were introduced" [20:149]. During the discussion which followed Dr. Cummings' presentation, several participants voiced similar concerns over the survey methods and the quality of the report. NSF requested further work on the report, but a final version was never published. Some of the details of the Herner plan were, however, eventually included in NLM's final design of the RML network [21:4]. The Bureau of the Budget did subsequently permit NLM to award MLAA authorized construction funds.

Official Design

NLM Extramural Programs (EMP) staff, Marjorie Wilson, M.D., Carl Douglass, Ph.D, and David Kefauver, were charged with preparing draft regulations to implement all the programs authorized by the MLAA, including the RMLP. The draft regulations were approved by the NLM Board of Regents at their March 1966 meeting, and were published in the *Federal Register* on July 13, 1966. Section C of the Rules and Regulations covered the grants for establishing RMLs.

The geographic composition of the regions was not specified; rather, a geographic area was defined as "...an area composed of any part or parts of any one or more states that forms an academically and professionally integrated region, taking into consideration such factors as location and extent of communication facilities and systems, presence and distribution of educational and medical and health facilities and programs..." [22:9502]. In the MLAA, libraries wishing to serve as RMLs were required to "modify and increase their library resources so as to be able to provide supportive services ..." [12:7]. Modify and increase was defined as "...the use of Federal funds or materials to supplement rather than supplant non-Federal

funds available for library resources and services" [22:9502].

Guidelines for Applicants

Wilson, Douglass, and Kefauver traveled extensively throughout the country in an effort to provide information on the proposed RML grant program prior to the publication of the official guidelines. Rather than specify the geographic composition of a region, NLM encouraged interested individuals and groups to schedule formal meetings to "...determine the natural and feasible configuration of their 'region' or area" [23:23]. It was recommended that the meetings include administrators, librarians, health professional users, representatives from state and local governmental and other health agencies, and other interested parties. After determining the geographic composition of a region, each applicant was required to undertake an extensive analysis of the information needs and resources of the area, and propose cooperative arrangements which built on existing relationships [23].

A preliminary fact sheet [24] followed by a series of *Information and Policy Statements* [25–27] issued by NLM formally announced the purpose and responsibilities of the RMLs, provided guidelines for applicants, and delineated NLM's role in the operation of the network. The statement of purpose remained essentially unchanged during the formative years of the network: "The fundamental purpose of regional medical library services is to optimize and equalize access to, and to provide for the most effective dissemination of health science information in all its forms, in order to respond effectively to the needs of health science investigators, practitioners, educators, and students" [27:1].

The 1967 *Statement* suggested that no less than 5% of the nation's health professionals should reside in a region; subsequent versions deleted this numerical guideline. RMLs needed to consider existing institutional relationships, patterns of communication, and health professional continuing education, and to have adequate resources and facilities to meet regional needs. The 1967 *Statement* defined adequate resources as the ability to fill 90% of requests for materials; this numeric standard was dropped in subsequent revisions. A comprehensive regional plan, assessing the information needs of the region's health professionals, was an essential part of the proposal, as was the establishment of an RML Advisory Committee including both librarians and health professionals.

Each of the three *Information and Policy Statements* defined the programs and services of an RML. As summarized below, each RML was required to:

1. Define the level and quality of present (pre-grant) and projected services.
2. Clearly state its goals for grant-supported library services and indicate how it would evaluate and estimate the need for new or revised services.
3. Provide the following services:
   a. Free loans[1] of library materials to qualified users within the region, including the provision of free photocopy services in lieu of the loan of the original. Beginning in 1968 a statement was added to allow for the provision of free loans across regional boundaries.
   b. MEDLARS search services. Initially RMLs were required to operate a MEDLARS search center; by 1968 the wording had been changed to require only the provision of formulation services for qualified users in a region. Beginning in 1968 RMLs were also required to provide search formulation services to users in other regions at the request of NLM or another RML.
   c. Back-up reference support to other libraries in the region, and on occasion, directly to individuals.
   d. Orientation and training of personnel from user institutions to ensure effective utilization of the network. In the 1967 *Statement* the training was to focus on regional library services; the 1968 *Statement* revised the wording to medical library services.
   e. Continual assessment of the region's information needs.
   f. Announcements of new acquisitions.
   g. Support for health professional continuing education programs.
4. Submit progress reports.
5. Administer the RML grant in accordance with specified legislative and governmental rules and regulations.

NLM's Management Role

NLM's role in the management of the network became more clearly defined in the successive

[1]Loan of library materials is defined as the loan of a physical volume or the provision of a photocopy in lieu of the loan of a volume.

versions of the *Statements*. In 1967 a general statement indicated that NLM would provide leadership and essential services, advice to regional planning groups on "...the establishment and operation of MEDLARS search services..." [252], and process the RML grant applications. The 1969 *Statement* delineated a number of responsibilities including provision of "...guidance for the development of service interrelationships required to coordinate the network" [27:1].

NLM would participate actively in the RML network, and was responsible for: (1) supporting the further development of the RMLs, (2) providing "back-up" library services to the RMLs, and (3) supplying "...guidance and direction necessary to coordinate the services provided by the regional medical libraries so that they may function as a 'national system' and thereby optimize and equalize access to health science information throughout the country" [27:2]. In this coordinating function NLM could specify standards for communication and practice among RMLs and adjust service workloads among the RMLs and NLM. The addition of such specific language concerning NLM's role was a result of the growing conviction among key NLM staff that an effective national network would not result without a certain amount of uniformity of policies and services. A further indication of NLM's intention to ensure uniformity was NLM's recommendation to the Board of Regents to add to the proposed MLAA extension authority to fund RMLs via contracts as well as grants.

The design of the RML network was evolutionary in nature, spanning the initial five-year period authorized by the MLAA. The final result was a hierarchical library network (Figure 2) in which NLM served as a comprehensive national back-up resource for all U.S. libraries, the RMLs shared their resources with libraries in a specified geographic area, and local health sciences libraries provided local health professionals with access to their collections and services and to the RML network [28:384]. The responsibility for disseminating mission-oriented information was not formally included in the final design of the RML network, since other federally funded projects already provided such services.

Establishment of the Network (1967–1970)

Network Policies and Architecture

Regional Planning Meetings

The regional planning meetings recommended by NLM were held throughout the country to determine the appropriate geographic boundaries for each region, and to select the library which would apply for the RML grant. The boundaries were not easily drawn, since political affiliations and geographic considerations complicated the decisions. Meeting organizers were free to select the participants, the only NLM requirement was that broad representation from various user and institutional categories be present. In most cases the individuals and institutions invited to participate reflected pre-existing regional affiliations.

The selection of an institution to serve as the RML was no less difficult; in several regions no single exceptionally strong library clearly emerged as the natural choice. Uncertainty over the number of RMLs which would eventually be funded also affected the planning process, although by June 1967, Carl Douglass, Ph.D, publicly stated "...that about ten such libraries (RMLs) should be supported under the current authorization" [29:50]. NLM's role throughout this planning process, as defined by Marjorie Wilson, M.D., was "...to maintain, insofar as possible, flexibility in working out ...supportive arrangements...in developing service patterns and resource configurations within each region..." [30:48].

Participants in the planning meetings included librarians, health professionals, administrators, and representatives from governmental and other health agencies. Of particular concern was the interrelationship between the RMLP and the Regional Medical Programs (RMP), a separate federal program which had also resulted from the President's Commission Report [2]. The purpose of the RMP was "...to make the latest advances in medical knowledge of the diagnosis and treatment of heart disease, cancer, and stroke available to physicians for the treatment of their patients all over the nation" [31:56]. To accomplish their mission, the RMPs planned extensive continuing education programs for health professionals and the lay public. A logical aspect of such continuing education programs was the provision of health information; it was evident that coordination between the two programs was essential.

Organizational Structure

Between 1966 and 1970 the boundaries for the original eleven regions (Table 2) were determined, and the applicant institution(s) designated. Two organizational patterns emerged. In *centralized* regions, regional services and management were primarily provided by staff located at the RML with cooperation and assistance from other

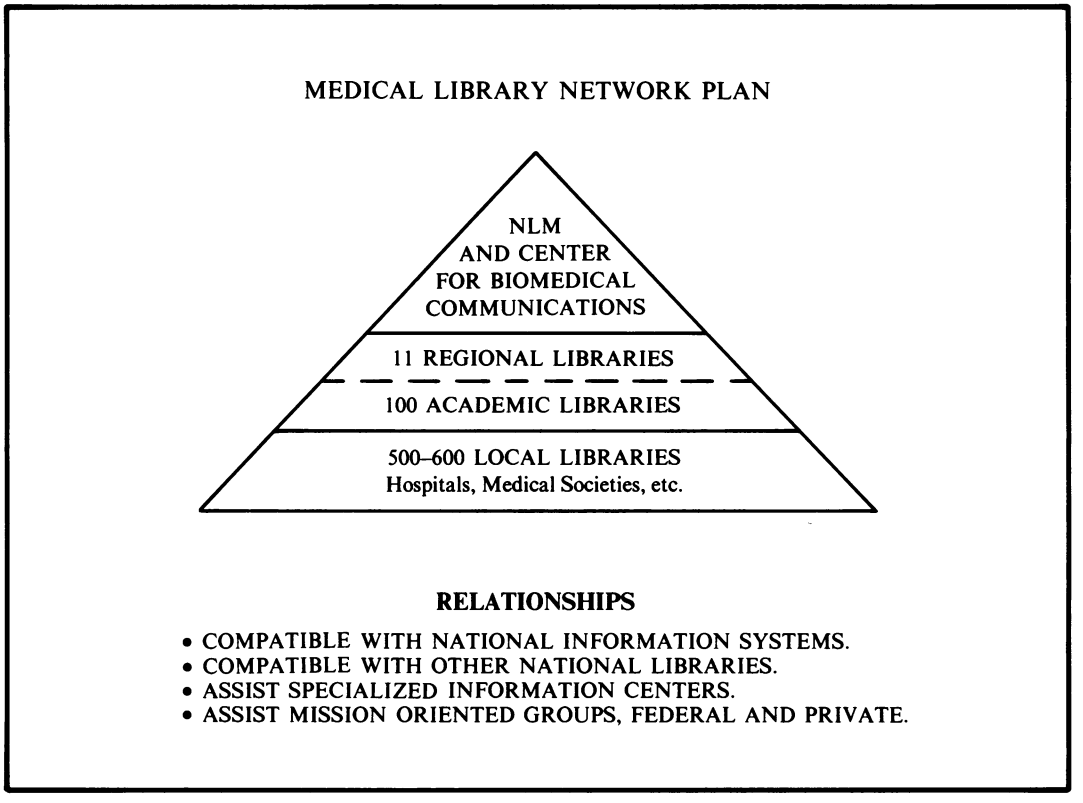


FIG. 2—Medical Library Network plan.

libraries in the region. *Decentralized* regions relied on more direct involvement of larger, mainly medical school libraries, eventually labelled *resource libraries* (RL). The RLs provided many regional services; the RML administered and managed the service program. The remaining library participants in each region were called *basic units* or *basic health sciences libraries* (BHSLs). BHSLs consisted mainly of hospital libraries but also included other libraries serving health professionals or students, such as community college or pharmaceutical company libraries.

The Original Eleven Regions

Region I: New England Regional Medical Library Service (NERMLS). The New England Regional Medical Library Service, the first RML to be designated, began operations at Harvard University's Francis A. Countway Library of Medicine in October 1967. The geographic composition of the region was easily determined, since the New England states of Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, and Vermont had long-standing affiliations. Two regional meetings were held in Boston in May 1966 and March 1967; the participants agreed that the Countway Library, which had recently been created by the merger of the Boston Medical Library and the Harvard Medical School Library, should apply for an RML grant. "The selection of the Countway Library as the home of...NERMLS...was based on the recognition that the library possessed outstanding collections..., a new and functional physical plant, and a tradition of regional service long recognized by the community" [32:329].

NERMLS was a centralized operation. There was, however, reliance on other regional resources. Because the Countway Library did not have a strong nursing collection, an arrangement was made with the Boston College School of Nursing Library to share their resources regionally. NERMLS also worked closely with the Postgraduate Medical Institute (PMI), an educational arm of the Massachusetts Medical Society. PMI had conducted a survey of hospital educational needs in New England and determined that library service needed improvement. NERMLS and PMI agreed to address this problem in concert. NERMLS collaborated with PMI to identify a "core collection" of books and journals designed to serve as a

TABLE 2

ORIGINAL REGIONAL MEDICAL LIBRARIES

Region	Regional Medical Library	Area Served	Date Operational
I	New England Regional Medical Library Service (NERMLS) The Francis A. Countway Library of Medicine Harvard University, Boston	Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, Vermont	October 1967
II	New York and Northern New Jersey Regional Medical Library (NY/NJ RML) New York Academy of Medicine Library, New York	New York and Northern New Jersey	February 1970
III	Mid-Eastern Regional Medical Library Service (MERMLS) College of Physicians of Philadelphia Library, Philadelphia	Delaware, Pennsylvania, Southern New Jersey	July 1968
IV	Mid-Atlantic Regional Medical Library (MARML) National Library of Medicine, Bethesda	Maryland, North Carolina, Virginia, Washington, D.C., West Virginia	October 1968
V	Kentucky, Ohio, Michigan Regional Medical Library (KOMRML)* Shiffman Medical Library Wayne State University, Detroit	Kentucky, Michigan, Ohio	April 1969
VI	Southeastern Regional Medical Library Program (SERMLP) A. W. Calhoun Medical Library Emory University, Atlanta	Alabama, Florida, Georgia, Mississippi, South Carolina, Tennessee, Commonwealth of Puerto Rico	January 1970
VII	Midwest Regional Medical Library (MRML) The John Crerar Library, Chicago	Illinois, Indiana, Iowa, Minnesota, North Dakota, Wisconsin	November 1968
VIII	Midcontinental Regional Medical Library Program (MCRMLP) Library of Medicine University of Nebraska, Omaha	Colorado, Kansas, Missouri, Nebraska, South Dakota, Utah, Wyoming	July 1970
IX	South Central Regional Medical Library (TALON) Health Science Center Library University of Texas, Dallas	Arkansas, Louisiana, New Mexico, Oklahoma, Texas	February 1970
X	Pacific Northwest Regional Health Sciences Library (PNRHSL) Health Sciences Library University of Washington, Seattle	Alaska, Idaho, Montana, Oregon, Washington	October 1968
XI	Pacific Southwest Regional Medical Library Service (PSRMLS) Biomedical Library University of California, Los Angeles	Arizona, California, Hawaii, Nevada	September 1969

*Initially called the East-Central Regional Medical Library.

minimum hospital library collection [33] and develop guidelines for the establishment of hospital libraries [34,35].

Region II: New York and Northern New Jersey Regional Medical Library (NY/NJ). The metropolitan New York City and northern New Jersey medical libraries enjoyed a long history of cooperation. As early as 1959, New York City area libraries had established the Medical Library Center of New York (MLCNY), created to provide centralized storage and acquisition of less-used materials, develop a Union Catalog of Medical Periodicals (UCMP), establish a delivery system between the Center and New York area libraries, and participate in cooperative acquisitions projects [36].

Then in 1963, Ralph Esterquest, librarian of the Harvard Medical Library, conducted a study on ways of strengthening medical library resources in the state, at the request of the Commissioner of Education of the State of New York. Esterquest recommended a statewide plan which included provisions for the New York Academy of Medicine (NYAM) to serve as a "reservoir" library for the state [37:2]. Thus, as Gertrude Annan described in her presentation at the 1963 Harvard meeting on regional medical library service, the cooperative programs already in place at the MLCNY "...could well be coordinated or integrated with other plans, either state or national" [36:508].

It was on this base of regional planning and cooperative experience that the NY/NJ region was developed. In 1967 the NYAM and the MLCNY submitted a joint application to serve as the RML for New York and Northern New Jersey (Bergen, Essex, Hudson, Hunterdon, Middlesex, Morris, Passaic, Somerset, Sussex, Union, and Warren counties). The NY/NJ application was problematic, since the funds requested to provide interlibrary loan service for the region amounted to "...twice the amount of money now available for the whole [RML] program" [3:2]. The grant proposal included plans to decentralize interlibrary loan services; the projected number of subsidized interlibrary loans which would be provided by the resource libraries in this very populous area of the country was considerable. In the spring of 1968 NLM approved the grant for a two-year period only, at a significantly reduced level of funding [39].

NLM specified that only the NYAM would be designated the RML for Region II and, due to limited funds, the NY/NJ RML began operations, in February 1970, as a centralized region. By the second year of its grant the NY/NJ RML was able to decentralize the interlibrary loan service, and entered into subcontracts with three libraries in the region.

Region III: Mid-Eastern Regional Medical Library Service (MERMLS). By 1963, Philadelphia area medical librarians and physicians had begun to develop plans for cooperative library services. They met formally as members of the Philadelphia Regional Medical Library Committee [40], and endorsed the "Philadelphia Plan" for regional library service presented by Elliot Morse at the 1963 Harvard meeting on regional medical library service [41]. This plan included providing services to the Philadelphia area, and adjacent counties in New Jersey.

The Library of the College of Physicians of Philadelphia had been serving as a regional resource for many years; an RML grant would provide a stable base of funding for such services. Initially there was some concern that only university-based libraries would be eligible to apply for RML grants [42]. In the final guidelines the only restriction imposed was that applicant institutions be non-profit [24].

By 1965 a "Proposed Cooperative Agreement between the College of Physicians of Philadelphia Library and Philadelphia Area Medical Libraries" was developed and endorsed by forty-five institutions. In order to fund some of the proposed services, such as subsidized interlibrary loans, the College library applied for and received a Resource Grant (funded via a separate authority of the MLAA), and applied to be a MEDLARS search center. Concurrently, with the endorsement of the Philadelphia Regional Medical Library Committee, the College submitted a letter of intent to NLM to serve as an RML for Pennsylvania, southern New Jersey, and Delaware. Delaware was added after a feasibility study indicated that it was appropriate to provide services to the area. The committee also planned a Regional Medical Library Conference to be held at the College in February 1967 [43]. Over 200 individuals attended the conference and endorsed the regional plan proposed by the College. MERMLS began operations a centralized RML in July 1968 [44,45].

Region IV: Mid-Atlantic Regional Medical Library (MARML). The Mid-Atlantic Region, composed of Maryland, North Carolina, Virginia, the District of Columbia, and West Virginia, was designated in 1968. North Carolina was originally included in the planning for the Southeastern Region, but librarians in the state requested assign-

ment to the Mid-Atlantic Region since they relied on library resources in Region IV more than those in the Southeast.

The NLM made the decision to act as the RML for the Mid-Atlantic region "...because of the strength of its resources and its central location for the users" [46:6]. There was also little interest among the region's larger libraries in serving as an RML. NLM planned to provide "... new and improved services to the region, including continuing education of medical librarians and training of health professionals in effective use of bibliographic resources, as well as providing liaison between NLM, other Federal medical operations, and the biomedical libraries in the region" [46:6]. The Reference Service Division of NLM was assigned the responsibility of coordinating regional services [47].

Two other factors influenced NLM's decision to serve as an RML. First, as a federal institution NLM was not eligible to receive RML grant funds; it was therefore able to stretch the limited funding available for the RML program. Secondly, NLM staff would be able to gain valuable operational experience if they were responsible for RML services in Region IV.

Region V: Kentucky, Ohio, Michigan Regional Medical Library (KOMRML). Considerable regional planning and activity led to the formation of the KOMRML. In the fall of 1964 the library directors of Wayne State University and the University of Michigan met to discuss ways of improving biomedical library service, and agreed to several cooperative ventures including interlibrary loan, shared bibliographic records, cooperative acquisitions, and the establishment of a MEDLARS search center. The University of Michigan became a MEDLARS search center in April 1966, followed in July 1967 by Ohio State University.

In late 1965 the medical library directors of Wayne State University and the University of Michigan proposed the establishment of a Biomedical Information Services Institute (BISI) to coordinate interinstitutional cooperation, and asked various organizations to participate in BISI's development. The Greater Detroit Area Hospital Council, Wayne County Medical Society, and Metropolitan Detroit Medical Library Group all agreed to participate. The University of Michigan subsequently withdrew, but the organization continued.

Wayne State University and eight hospital libraries in the Detroit area joined in 1966 to form the Central Medical Library Service (CMLS). With funding from an NLM Resource Grant CMLS expanded its union list of serials and book catalog, provided subsidized interlibrary loan service, employed staff to bring the CMLS collections under uniform bibliographic control, and supported cooperative acquisitions. Concurrently, the Michigan Interinstitutional Committee for Information Systems (MICIS), with membership from Wayne State University, Michigan State University, and the University of Michigan, was formed and began to consider the development of an RML. An initial planning meeting held in April 1967 yielded the recommendation that MICIS contact the academic institutions of Indiana, Kentucky, Ohio, and Michigan to inform them of the preliminary plans for RML services, and invite their comment.

While awaiting responses, MICIS prepared a draft RML proposal without designating a headquarters library. This draft was forwarded to NLM for comment, and was subsequently presented to representatives from ten institutions in Kentucky, Ohio, and Michigan at a regional planning meeting in November 1967. Indiana did not send a representative, and subsequently became part of the Midwest Region. At the meeting the participants agreed to form a "... cooperative enterprise of a regional library" [48:10], with Wayne State University selected to submit the grant application to NLM. KOMRML began operations as the first decentralized region on April 1, 1969 [49].

Region VI: Southeastern Regional Medical Library Program (SERMLP). Several medical school libraries in the southeastern section of the nation were very interested in receiving grant funds to provide RML services for Region VI. A series of regional meetings were held throughout the area, but consensus on a single applicant institution was not reached. Subsequently, NLM reviewed applications from the University of Alabama Medical Center, Birmingham; Vanderbilt University Medical Center, Nashville; Duke University Medical Center, Durham; and Emory University, Atlanta. Each proposed that the region be decentralized, with a consortium of twelve medical school (resource) libraries providing regional services.

The A. W. Calhoun Medical Library at Emory University was selected by NLM to serve as administrative headquarters for SERMLP, comprising the states of Alabama, Florida, Georgia, Mississippi, South Carolina, and Tennessee, and the Commonwealth of Puerto Rico. North Carolina requested and was granted assignment to the Mid-Atlantic Region. Although not officially considered

part of the region initially, over time regional services were provided to the Virgin Islands. SERMLP began to offer services in January 1970.

Region VII: Midwest Regional Medical Library (MRML). Regional planning for the Midwest region began in December 1966. Librarians and health professionals from a number of Chicago's health sciences institutions met at the American Medical Association (AMA) headquarters with a representative from NLM. As a result of this initial meeting, a local planning committee was established to select and sponsor an institution as the RML. In February 1967 librarians from sixteen Chicago institutions met and appointed subcommittees to survey the information resources and needs of the area. Contact was made with many health-related organizations and libraries in neighboring states to assess interest.

Initially the University of Illinois Medical Library, the John Crerar Library, the University of Minnesota Biomedical Library, and the University of Wisconsin Medical Library were all interested in becoming the RML. The University of Wisconsin had in fact, been operating a Medical Library Extension Service since 1926, providing both loan and reference service to health professionals in the state [50].

In July 1967 the first meeting of a regional council, attended by representatives from Illinois, Iowa, Wisconsin, and Minnesota, was held and began discussions on regional policies. In the fall of 1967 Crerar submitted an RML grant proposal to NLM. The Crerar proposal was subsequently reviewed and accepted by the regional council, with some revisions, including the addition of Indiana to the original group of states to be served by MRML. In November 1968 the John Crerar Library began to provide centralized service to the states of Illinois, Indiana, Iowa, Minnesota, and Wisconsin. The geographic composition of the Midwest Region was adjusted in 1970 when North Dakota was added [51].

Region VIII: Midcontinental Regional Medical Library Program (MCRMLP). To quote Bernice Hetzner, the first MCRMLP director, "The Midcontinental Regional Medical Library area came into being by a process of elimination" [52:247]. As the last RML to be formed, it became responsible for those states which had not joined another region. Considerable planning of RML services took place in Region VIII. As early as 1966 a group of librarians from Nebraska, Colorado, Iowa, Kansas, and North and South Dakota met to discuss plans for a union catalog. In 1967 St. Louis, Missouri, area medical librarians met with David Kefauver from NLM to discuss regional medical library planning. This group then sponsored a meeting of representatives from medical libraries in Colorado, Kansas, Missouri, Nebraska, North and South Dakota, and Utah held on April 22, 1968. This meeting resulted in the formation of a temporary organization, the Central States Regional Medical Library Group, which was to designate responsibilities for regional service and prepare the grant application.

Some regional programs were instituted during this planning period. For example, the medical libraries of Washington University in St. Louis, and the Universities of Colorado, Kansas, and Nebraska each agreed to contribute funding for the preparation of a union list of serials by the Medical Library Center of New York. Dr. Estelle Brodman, by that time director of the Washington University Medical Library, coordinated the technical aspects of the union list contract. MEDLARS search services had been provided to the area since 1965 by the University of Colorado Medical Library. In the end the University of Nebraska submitted the RML grant application and became responsible for the administration of this decentralized region. The Midcontinental RML became operational in July 1970, serving the states of Colorado, Kansas, Missouri, Nebraska, South Dakota, Utah, and Wyoming [53]. North Dakota, which had been involved in the planning discussions, requested assignment to the Midwest Region.

Region IX: South Central Regional Medical Library (TALON). "The South Central RML grew out of an organization known as the Texas Council of Health Sciences Libraries formed in 1966" [54:203]. Council membership was composed of both librarians and health professionals. In December 1966 an NLM representative attended a meeting of the Council to discuss regional medical library services. In September 1967 the directors of the major medical libraries in the states of Arkansas, Louisiana, New Mexico, and Oklahoma were invited by the council to a meeting to discuss the formation of an RML. Upon examination of the resources and needs of the region it was "...concluded that the area did not have an establishment which was of outstanding stature adequate to perform, by itself, the functions of a regional medical library. This factor ...led to the development of a consortium of libraries acting as a decentralized regional library" [54:204].

The original grant proposed that TALON (Texas, Arkansas, Louisiana, Oklahoma, and New Mexico) be organized as a separate institution. This idea was not approved by NLM, so TALON became administratively part of the University of Texas Southwestern Medical School, later renamed University of Texas Health Science Center, Dallas [55:2]. TALON became operational in February 1970.

Region X: Pacific Northwest Regional Health Sciences Library (PNRHSL). Formal regional medical library planning began in the Pacific Northwest at an invitational conference held at the University of Washington, May 12-13, 1966. Librarians and health professionals from Washington, Oregon, Alaska, Idaho, and Montana were in attendance, as were invited participants from other areas of the United States and British Columbia with experience in the provision of regional library services. The conclusion of conference participants was that the Pacific Northwest states should investigate the possibility of forming an RML region for the provision of RML services [20].

An application to serve as the RML for the Pacific Northwest region was subsequently submitted by the University of Washington Health Sciences Library. PNRHSL began to direct the efforts of this centralized region, which comprised the states of Alaska, Idaho, Montana, Oregon, and Washington, in October 1968.

Region XI: Pacific Southwest Regional Medical Library Service (PSRMLS). The Medical Library Group of Southern California (MLGSC) formed a committee in January 1967 to begin planning RML services for a region which would comprise Southern California and Arizona. With concurrence from the Medical Library Group of Arizona, MLGSC recommended that the University of California, Los Angeles (UCLA) Biomedical Library be designated as the RML. The committee was also in communication with the Northern California Medical Library Group in hopes that planning would begin for a region composed of Northern California and Nevada.

By June 1967, it became evident, upon consultation with NLM, that the size of the proposed region would have to be enlarged, so the MLGSC committee obtained support from the California Committee on Regional Medical Programs to sponsor a regional planning meeting. On March 21, 1968, over fifty health professionals and librarians from Arizona, California, Hawaii, and Nevada attended a meeting at UCLA. The consensus of the participants was that the UCLA Biomedical Library should prepare an RML grant proposal for the four-state region. PSRMLS began service in September 1969.

PSRMLS operated in a centralized mode with one exception. Interlibrary loan service responsibilities were shared between the UCLA Biomedical Library (serving Arizona, Hawaii, and Southern California) and the Library of the University of California, San Francisco (serving Nevada and Northern California). This arrangement was devised to divide the interlibrary loan traffic between the two strongest collections in the region, and leave open the possibility of subdividing the region should additional RML funds become available [56].

Organization and Management of the RML Program

Regional Organization and Management

The RML directors were in most cases the directors of the library selected as the RML. They had overall management and fiscal responsibility for the program, and were actively involved in the discussion of policy issues, both at national and regional levels. Generally, the day-to-day operations of each RML program were the responsibility of an associate director. The names of all RML directors and associate directors are included in Appendix 1.

Each region was required by NLM to have an advisory committee which included "...representatives from the fields of professional practice, health science librarianship, health communications and other fields related to health" [25:7]. In most centralized regions one advisory committee, composed of librarians and representatives from the various user groups, advised the RML on policy and procedural issues.

Decentralized regions often had more than one advisory committee. A committee of librarians and user representatives, or occasionally only user representatives, advised on policy issues. A separate committee, frequently called the executive committee, usually composed of RL directors, provided substantial input into the operation of the RML.

The composition and role of regional advisory committees was an issue of frequent debate between the RML directors and NLM. From NLM's point-of-view, the representation on many of the RML advisory committees was too narrowly defined, with only physicians and medical school librarians serving. NLM urged RMLs to include

representation from all the health professions and other types of network libraries, believing that it was critical to the program to have input from all user groups [57]. Another issue was the role of the advisory committee in the governance of the RML. In some regions, especially decentralized ones, it was felt that control of the RML was vested in the advisory or executive committee. NLM clarified this matter by insisting on only an advisory role for these committees.

Management of the Program at NLM

During the formative period of the RML network, 1966–70, much of the management of the program was the responsibility of the Extramural Programs (EMP) staff. In 1966 a separate division of EMP, the Facilities and Resources Division, was created to oversee the award and management of the RML grants [18].

Also in 1966 a Facilities and Resources Committee was appointed to review all Regional Medical Library, construction, and resource grant proposals. The NLM Board of Regents, acting in its capacity as the National Medical Libraries Assistance Advisory Board, gave final approval to all RML grant awards.

Even though EMP had clear responsibility for the management of the RML program, RML operations were of tremendous concern to NLM's Library Operations (LO) staff. Not only did regional interlibrary loan policies and procedures need to interrelate smoothly with LO's interlibrary loan operations at NLM, but the management of the decentralized MEDLARS network was the direct responsibility of LO. Some of the earliest training programs offered in the regions were MEDLARS orientations developed initially by NLM staff.

The grant funding mechanism for the RMLs was not conducive to the management control which LO felt was needed in some areas such as MEDLARS. It was difficult, for example, to impose productivity standards on grant recipients. The idea of funding the basic RML services via a contract mechanism was therefore proposed "...the expansion of the decentralized MEDLARS program, both domestically and internationally, and the establishment of the RMLP did much to necessitate further centralized control to obtain a higher level of performance" [58:24]. A list of NLM key staff who were involved in the management and operations of the RML program is included in Appendix 2.

RML Directors' Meetings

As the RML regions were being formed, most policy and procedural discussions concerning the operation of the RML network ensued independently between NLM staff and individual regions. The RML directors found this situation less than satisfactory, since policies previously agreed upon were occasionally revised in light of differing practices or circumstances elsewhere in the country.

In an effort to improve communications between regions, Vern Pings, Ph.D., KOMRML director, invited all RML directors to participate in a meeting to be held in conjunction with the Medical Library Association annual meeting in Louisville, in October 1969. Joseph Leiter, Ph.D., associate director of NLM, suggested that the meeting be officially sponsored by NLM, thus setting the stage for the first RML Directors' Meeting. These meetings would eventually become a regular semiannual event, designed for the communication and discussion of RMLP policies and services, and the sharing of information among regions and NLM.

A review of the minutes of the RML Directors' Meetings in 1969 and 1970 delineates some of the policy and procedural questions which arose during the initial development of the RML network. The decisions reached had significant impact on the operation of the network over time, and serve to illustrate the evolution of the RMLP.

There was considerable discussion about the merits of centralized versus decentralized mode of operation. NLM was concerned about the variations in management brought about by the different organizational patterns, and the possibility that decentralized regions were more expensive to operate. These issues were to be examined after NLM and the RMLs gained more operational experience.

The MLAA clearly stated that RML services were to *supplement, not supplant,* existing services [12]. In order to insure that this guideline was being followed, NLM needed to determine a way to measure pre- and post-award activity. Initially NLM thought that interlibrary loan statistics would provide the needed information, but the lack of standardization in statistical records and the tremendous amount of variation in regional interlibrary loan practices made this task impossible. With the agreement of the RML directors, NLM proposed the use of operating budgets as the measure. As long as institutional budgets did not decrease after receipt of RML funds, then the requirement of supplementation was met.

Interactions between the RML network and

other health-related programs were of considerable concern to NLM. Most particularly, there was interest in establishing close working relationships with Regional Medical Program (RMP) offices, so that programs and services of the RMLs and RMPs would be complementary. NLM worked at the national level to coordinate services [59] and each RML attempted to do the same in its respective region.

Programs and Services

Interlibrary Loan

Subsidized (free) interlibrary loans were the most visible and popular service provided by the RML network in its first years of operation. Regional resources were to be used first; NLM would provide interlibrary loan service only after regional resources were exhausted. To insure that interlibrary loan requests were submitted first to local libraries, NLM restricted direct access to its interlibrary loan service to all but a few specified libraries. Libraries which could submit requests to NLM included the RMLs, the resource libraries (RLs), and a few "designated" libraries, primarily libraries which had major collections but were not participating in the RML network as RLs. It was recognized that the staff of the designated library would have the bibliographic tools to determine where interlibrary loans should be sent. Examples of designated libraries included the Center for Disease Control Library, Atlanta, and the Library of the University of California, Berkeley.

In centralized regions the subsidized loans were provided primarily by the RML, although as noted previously, some centralized regions had special interlibrary loan agreements with one or two other libraries. Requests for subsidized loans were not supposed to go to the RML unless the requested material was not available locally. Basic health sciences libraries (BHSLs) were expected to use the resources of other BHSLs and their local RL prior to coming to the RML. In decentralized regions the RLs received funding from the RML grant to provide subsidized interlibrary loan service. Generally, this was done on a per transaction contract basis. There was some initial confusion as to whether this latter practice "supplanted" previously existing service. In fact, KOMRML initially decided that its "participating [resource] libraries" would charge local borrowers for interlibrary loans, according to established practice. NLM, however, required that loans provided by KOMRML RLs be subsidized by grant funds, as they were in all other regions [60:2].

If an RML could not fill an interlibrary loan request, the request would be referred to NLM or another RML; in decentralized regions, RLs also referred requests to other RLs, RMLs or NLM. Health professionals who lacked access to a library could request materials directly from the RML.

The Midwest Region undertook an analysis of interlibrary loan activity during 1968/1969 to determine what types of materials were requested and who was using the service. This study revealed that 86.8% of the requests were for periodical articles, 76.3% of the requests were for materials published within the last ten years, and 42.9% of the interlibrary loans processed were for materials requested by physicians [61].

In the earliest years of the RML program there were no restrictions on the number of subsidized loans an institution could request. However, in the face of declining funding, some limits on the provision of subsidized photocopies of journal articles began to be imposed to control costs. In some regions quotas were placed on the number of subsidized loans available, restricting either the number of photocopy requests which would be filled per year, or the number of photocopy exposures which would be provided.

PSRMLS also developed two "restricted title lists" to insure compliance with the requirement that local resources be tried prior to requesting material from the RML. One list included 30 commonly available periodical titles, the second listed 100 titles. Subsidized interlibrary loans would not be provided for articles published in the most recent five years from any of the thirty titles on the first list. The 100-title list was used in the metropolitan Los Angeles and San Francisco areas, where library resources were stronger.

Several interlibrary loan policy questions arose in the first five years of RML network operations. Early versions of the RML *Fact Sheet* [24] and the *Information and Policy Statements* [25–27] specified that only non-profit institutions were eligible to receive RML services, including interlibrary loans. In response to the considerable pressure exerted on NLM by members of the for-profit health care industry the restriction on the provision of RML services to non-profit institutions was removed in August 1969. This policy change had an immediate financial effect on the budgets of the RMLs already in operation, since they had not planned to provide subsidized loans to this additional category of user. On September 25, 1969, a small group of librarians, including some RML directors, and NLM staff met at NLM to discuss implementation

of this new policy. In his opening remarks at this meeting, Martin M. Cummings, M.D., expressed an NLM management viewpoint which was to remain consistent over the years: policies established by the RMLs should be as uniform as possible, and compatible with NLM policies. Minor regional variations were acceptable when necessary, but uniformity was the desired goal. Dr. Cummings also questioned the appropriateness of quotas to limit interlibrary loan expenditures, and hoped participants would find alternatives [62].

One result of the meeting was a definition of interlibrary loan requests which were eligible for RML service: all requests for health-related information submitted by libraries for anyone other than lay personnel and high school students, and all requests submitted directly by health professionals without access to a library. There was also agreement that some form of an interlibrary loan quota system was necessary to insure equal access to health information and to assure that RML interlibrary loan funds would not be consumed by heavy users at the expense of occasional users [62].

Union Lists

In most decentralized regions, the creation of a union list of serials, identifying the extent of holdings of each owning library, was an essential first step, since it facilitated the referral of interlibrary loan requests between the RLs and the RML. Some regions, such as NY/NJ and MCRMLP, already had a list which included the holdings of

TABLE 3

REGIONAL MEDLARS SERVICE CENTERS, JULY 1970

Region I
New England Regional Medical Library
The Francis A. Countway Library of Medicine
Harvard University
Boston, MA

Region II
New York and Northern New Jersey Regional Medical Library
New York Academy of Medicine Library
New York, NY

Region III
Mid-Eastern Regional Medical Library
College of Physicians of Philadelphia Library
Philadelphia, PA

Region IV
Mid-Atlantic Regional Medical Library*
National Library of Medicine
Bethesda, MD

Region V
MEDLARS Center*
University of Michigan
Ann Arbor, MI

MEDLARS Center*
Health Center Library
Ohio State University College of Medicine
Columbus, OH

Region VI
MEDLARS Center*
Medical Center Library
University of Alabama
Birmingham, AL

Southeastern Regional Medical Library
A. W. Calhoun Medical Library
Emory University
Atlanta, GA

Region VII
Midwest Regional Medical Library
The John Crerar Library
Chicago, IL

Region VIII
MEDLARS Center*
Denison Memorial Library
University of Colorado Medical Center
Denver, CO

Region IX
MEDLARS Center*†
Texas Medical Center Library
Houston, TX

Region X
Pacific Northwest Regional Health Sciences Library
Health Sciences Library
University of Washington
Seattle, WA

Region XI
Pacific Southwest Regional Medical Library
Biomedical Library
University of California, Los Angeles
Los Angeles, CA

*MEDLARS Center with machine-processing capabilities.
†Effective April 1, 1971 the South Central Regional Medical Library, Health Science Center Library, University of Texas, Dallas became the MEDLARS Search Center for Region IX.

many of the RLs. Others, such as TALON, SERMLP, and KOMRML, had to compile one. In the centralized regions the serials holdings list of the RML served as the initial serials locator publication.

Once union list efforts were underway, NLM and the RMLs quickly recognized that a single, national union list of serials would be extremely beneficial. The issue of standards for union lists was discussed, and since several of the RMLs planned to use the services of the Medical Library Center of New York, creators of the Union Catalog of Medical Periodicals and of the NY/NJ RML and the MCRMLP union lists, tentative agreement was reached to use these standards in the creation of all regional lists.

MEDLARS Search Services

Each RML also coordinated the provision of MEDLARS search services. Searches were formulated at regional MEDLARS service centers (Table 3) and were forwarded to NLM for batch processing, with an average turnaround time for searches of four to six weeks. In seven regions the RML itself was the MEDLARS service center. In three of the other regions service was provided by the MEDLARS centers which had been established during the decentralization of MEDLARS, and in Region VI service was shared between the RML and a MEDLARS center.

Reference Services

Backup reference service was provided in all regions. The amount and nature of this service varied greatly among the regions, and initially RML reference staff spent much of their time deciphering incomplete or incorrect interlibrary loan requests. Other reference services included answering queries referred by BHSLs, locating translations of foreign language journal articles, and compiling bibliographies on topics not suitable for searching on MEDLARS.

Consulting and Training Services

All RMLs recognized that to insure effective use of the network under development, some form of consulting and training services should be provided. Hospital administrators and library committees would need advice on the type and size of library required by their institution to meet immediate information needs, and many of the individuals staffing these libraries would require basic training. In centralized regions the consulting and training services were provided by RML staff; decentralized regions made plans for the provision of this service by staff located at the RLs.

Publicity and Publications

Other initial services included the publication of brochures, recent acquisitions lists, and newsletters; exhibiting at health professional meetings; and planning cooperative efforts with other networks and programs. Articles describing the RML network and its services were published in a variety of health professional publications [63–85]. A listing of RML newsletters is included in Appendix 3.

Network Evaluation

RML Status Report—1970

Robert Walkington and E. Wayne Herron, EMP staff, prepared a report in 1970 on the RML program. They reviewed the status and development of the program, and conducted an analysis of the four RMLs with at least one year's operating experience—NERMLS, MERMLS, MRML, and PNRHSL. Much of the information regarding the status and development of the RMLP presented in this report has been discussed earlier. What is most interesting was this initial attempt to "evaluate" RML operations.

After considering various evaluation methods, the authors felt that "...in a new and complex program a fairly subjective methodology and a case-history approach would be most appropriate" [86:18]. They were interested in the effectiveness of each RML, type and quality of services being provided, advisory committee structure, regional cooperative relationships, and planning efforts.

Five major program areas were evaluated: interlibrary loan; reference; MEDLARS formulations; consultation and education; and planning, program analysis, and administration. There was regional variation in interlibrary loan performance, based in part on the number of interlibrary loans processed and the strength of the collection at the RML. All four libraries were processing a large number of requests and were doing so expeditiously. With the exception of the Crerar Library, over 80% of the requests received were filled. Considerable variation was found in the type and amount of both reference and consultation and educational programs provided. Both these services were still under development at all the RMLs, and it was clear that policies would need to be discussed in the future.

MEDLARS was deemed to be an important activity, and one which consumed a significant portion of RML funds. The four- to six-month training program at NLM for search analysts was expensive. To provide needed coverage, it was

desirable to have a minimum of two search analysts per MEDLARS center, yet the number of regional search requests did not always require this level of staffing.

All RMLs evaluated seemed actively involved in the evaluation of existing services, and were handling these responsibilities well. Increased emphasis needed to be placed on the more difficult task of analyzing and projecting overall regional needs.

The report identified problems relating to major policy issues, many of which were similar to those already being considered by the RML directors. Some additional policy issues not discussed earlier included: (1) concern that in some regions RML grant funds were being used to support basic library operations in the RML headquarters library; (2) more program publicity and outreach efforts were needed, particularly outside the immediate metropolitan area where the RML was located; and (3) the level of grant support in each region varied, due to the way the network was established. That is, programs funded with RML grant funds in one region were not funded in another due to budgetary limitations.

In their conclusion, the authors pointed out that the changes authorized by the 1970 extension of the MLAA would be of assistance in solving some of the problems encountered. The increased authorization level would benefit the RML budgets, the new section on planning and evaluation would allow funding for these activities, and the use of contracts rather than grants would promote uniformity among the regions [86].

In their review of the RML program through 1970, Dr. Cummings and Mary E. Corning, Ph.D., addressed the issue of the impact of the RML network on the user. "Conceptually, we believe that the value of the network is clearly demonstrated by the rising number of service requests made to local and regional libraries and by the increasing number of responses made by these libraries. We do not have, however, a quantitative measure of user reaction" [28:390]. The RML network had completed its formative years with decided success, and began to concentrate on program development and evaluation.

Operation of the Network (1971–1981)

Network Policies and Architecture

Contract Funding

The extension of the MLAA in 1970 for a three-year period provided the necessary funding to continue the development of the RML network. Two new authorizations added to the MLAA had a significant effect on the operation of the network: funding of RMLs was now permitted by both the contract and grant mechanisms, and RMLs were authorized to engage in regional planning efforts.

In November 1970, the Board of Regents approved policy guidelines for RML contracts. As stated in the policy, "The intent of the conversion to contracts is to use this as a mechanism for a more controlled and coordinated allocation of resources to insure maximum service" [87:Attachment]. Contracts would cover the provision of essential services, defined at that time as interlibrary loan, MEDLARS search formulation, and reference services. NLM could contract separately for research and development projects for program development. Regional union book catalogs were expressly excluded from contract negotiations. RMLs could also apply for grant funding to support other "...innovative and experimental activities" [87:Attachment]. As the original RML grants expired, they were converted to contracts, although a number of RMLs continued to receive grant funds for specific projects and services.

By June 1971, seven of the ten grant-funded RMLs had completed contract negotiations with NLM. NLM also notified the Board of Regents that it intended to develop a formal RML policy statement to "...eliminate ambiguity and provide uniform understanding of the nature of the program..." [88:11]. Dr. Cummings also informed the Board that a subcommittee of the Biomedical Library Review Committee (BLRC), called the RML Committee, had been appointed to assist in "...reviewing current and potential RML problems" [88:12]. The BLRC had assumed the responsibilities of the former Resources and Facilities Committee in 1970. The RML Committee's review was conducted in the last six months of 1971; its report was issued in May 1972.

The RML Committee made eleven recommendations or observations which they felt would improve the effectiveness of the RML network [89].

1. Broader participation in the development of RML policy and procedures in each region should be required. Librarians from all types of libraries and a broad spectrum of health professionals should be represented on advisory committees.
2. A study of the "net lender" concept for interlibrary loan, as it pertained to the financing of interlibrary loan requests, should be undertaken. A net lender was

defined as a library that loaned more items than it borrowed.

3. The impact of fees for services and other methods of financing RML services should be measured.
4. The RML program should be evaluated periodically on a national level.
5. More effective liaison with the RMP should be established.
6. RML directors should review and comment on all resource grant proposals originating from their region.
7. If feasible, RMLs should engage in the distribution of non-print media.
8. NLM should consider designating a specific budgetary amount for the provision of regional services in the Mid-Atlantic Region.
9. RML directors should give more emphasis to overall regional planning and evaluation.
10. NLM should reconsider its present restrictive policy on the development of union lists.
11. The designation of existing libraries as RMLs created a potential for conflict between institutional and RML policies. Through proper leadership and management, such conflicts could be minimized.

RML *Policy Statement*

The NLM *Regional Medical Library Program (RMLP) Policy Statement,* published in April 1972, delineated the program objectives and specified the organization and responsibilities of network participants. The primary objective of the RMLP was to provide access to health information through the delivery of documents in a rapid, cost effective, and efficient manner.

The hierarchical organization of the network which had evolved since 1967 was formally explained, and specific responsibilities of each of the four categories of participants delineated: (1) *basic units,* primarily hospital and other health related libraries, were responsible for the development and management of their own information resources, and for interacting with their nearest resource library; (2) *resource libraries,* primarily medical school libraries, were requested to support the information needs of local basic units, and work with other RLs, the RML, and NLM towards the development of the network; (3) the *RMLs* were to provide backup support to the RLs, plan and coordinate the region's network activities, comment on the regional implications of resource improvement and project grants submitted to NLM from their region, and provide backup educational support; (4) *NLM* was responsible for the coordination and management of both the network and network planning, and served as a backup to the RMLs and as the RML for the Mid-Atlantic Region [90].

The issuance of the policy statement clearly delineated NLM's expectations for the network and its participants. It was a critical step, since it provided conceptual guidelines and priorities for network activities. In his analysis of the policy statement, Pings outlined the changes necessary in order to accomplish the stated objectives. RMLs and RLs, as departments within universities, would need "...to expand their 'sphere of influence,' and ...adjust to new internal routines and procedures in order to have a stabilized network" [91:276]. The base of the network, composed of basic units, would have to be dependable and well developed. "...the RMLP will have to change not only the operations but even some of the objectives of some of the basic units" [91:278]. Effective communications between all levels of the network, and continual evaluation of network activities would be extremely important.

The *RMLP Policy Statement* also specified the RMLPs relation to the Biomedical Communications Network (BCN), which NLM was in the process of developing [92]. "The network being created in support of the RMLP will form the matrix for the evolution of a more comprehensive BCN in which the nation's medical libraries will always be important nodes, and the resource and regional medical libraries will be critical switching stations" [90:271].

Harold Schoolman, M.D., who in his role as special assistant to the (NLM) director for Medical Program Development and Evaluation promulgated the policy statement, recognized the potential conflicts which could arise when libraries assumed these expanded roles. "No matter how organized, the program makes immediate demands for resources and facilities, for the establishment of priorities and, therefore, for specific commitments. These commitments are neither insignificant nor transient.... It is our belief that in the long run the institutional objectives will also be better served; they will gain more than they give up" [93:284].

Organization and Management

Regional Organization and Management

Several organizational changes in the RML network occurred between 1971 and 1981. In May

1973 the MRML changed its mode of operation from centralized to decentralized. The name of the region was also changed, first in October 1973, to the Midwest Medical Library Network, and shortly thereafter, in January 1974, to Midwest Health Sciences Library Network (MHSLN) [51].

In 1975 NLM gave terminal contracts to the New York Academy of Medicine (NY/NJ RML) and the College of Physicians (MERMLS) and issued a Request for Proposal (RFP) for provision of RML services in the two regions. In Region II the Medical Library Center of New York competed with the Academy for the RML contract; there was no competition in Region III. At the conclusion of this contract bidding process both the Academy and the College retained their RML contracts, but the geographic composition of the two regions changed. Effective May 1976, Region II comprised the state of New York and now the entire state of New Jersey; Region III encompassed Delaware and Pennsylvania.

By 1979, in response to internal Department of Health, Education, and Welfare regulations concerning contract administration, it became necessary to compete for all RML contracts. RFPs for three-year RML contracts were issued between 1979 and 1981 as the existing contracts expired. All RML host institutions remained the same except in Region VII. In January 1980, the University of Illinois, Library of the Health Sciences, Chicago, replaced the John Crerar Library as the RML for the MHSLN. The only other competition encountered during this round of contract negotiations was in Region VI where both the Medical University of South Carolina and Emory University submitted proposals. Emory retained the RML contract for Region VI.

Management of the Program at NLM

The conversion of RML support from grants to contracts precipitated a reconfiguration of the management responsibilities for the RML program at NLM. At the June 1971 Board of Regents meeting, Dr. Harold Schoolman announced that network management and control would be the responsibility of a senior management group. Schoolman would chair this group which also included the associate directors of Library Operations (LO) and Extramural Programs (EMP). LO would be responsible for the negotiation and performance of the RML contracts. EMP would supervise and direct the RML grants, and maintain fiscal control over both the contracts and grants. Schoolman would be responsible for coordinating both the intramural and extramural activities of NLM as they related to the RML program [88].

Until late 1978, management of the RML program at NLM continued to be the shared responsibility of the associate directors of EMP and LO. The RML directors became increasingly frustrated with this arrangement, which occasionally resulted in contradictory policy or procedural interpretations at NLM. The directors regularly reiterated the suggestion, first stated in 1971, that a single RML program coordinator at NLM be appointed. In August 1978, Sheldon Kotzin was appointed the first RML coordinator, initially reporting to the associate director for EMP [94]. By late 1979 all RML functions, including the management of Region IV, were consolidated in the office of the RML coordinator who reported first to the deputy director of NLM and subsequently to the associate director for LO [95].

Hospital Librarians' Meeting

In January 1978, NLM hosted an invitational meeting of one hospital librarian from each of the eleven regions to discuss the relationships between NLM activities and hospital libraries [96]. Their comments resulted in several new program directions, including a decision by NLM to actively encourage hospital libraries to become MEDLINE (*MED*LARS On*line*) search centers.[2] A statement prepared by the hospital librarians summarized their comments relating to the RMLP:

> We also want to go on record as strongly supporting the Regional Medical Library concept, although we recognize that the RMLs at present function with varying degrees of effectiveness. We hope and expect that the input of hospital librarians into RML plans and programs will help them to effectively serve the needs of their regions [97:5].

RML Directors' Meetings

The changes resulting from conversion to contract funding mechanisms and divided management responsibilities for the RML program at NLM resulted in some temporarily strained relationships between the RML directors and NLM. In May 1971 the RML directors had their first independent meeting in New York, prior to the official RML Directors' Meeting sponsored by NLM. Joseph Leiter, Ph.D., associate director of Library

[2]MEDLINE, the online version of MEDLARS, is described in the MEDLARS/MEDLINE section which follows.

Operations, attended this meeting as the RML director for Region IV. Many of the agenda items dealt with ways to improve communications and management of the RML program. One suggestion was the establishment of a National Council of Medical Librarians to advise NLM on the RML program. The directors also requested that an RML project officer, with pertinent library experience, be appointed at NLM, and that the RML associate directors, who had day-to-day management responsibilities for the RML programs in each region, be permitted to attend the RML Directors' Meetings [98]. These informal meetings continued for several years, providing the RML directors with an opportunity to exchange information and let off steam.

The 1972 *RML Program Policy Statement [90],* developed in consultation with the RML directors, delineated NLM's expectations, and assisted in unifying RML program efforts. By 1974 the RMLs and NLM were working in a more coordinated fashion, as evidenced by the RML-NLM Working Committees established to examine various policy issues and services. The work of these committees is further described under Programs and Services.

At the November 1978 RML Directors' Meeting, James F. Williams, KOMRML director, suggested that NLM and the RML directors conduct an intensive planning meeting to develop a common understanding of the goals of the RMLP; identify future directions and performance measures for the network; establish priorities for funding; strengthen the relations between the eleven RMLs; and design a methodology for continuing the planning process [99].

NLM responded positively and funded a meeting for RML directors, associate directors, and NLM staff in April 1979. At this meeting a revised mission statement was developed [100], and seven task forces were established to deal with the various issues raised during the planning session. The task forces were asked to consider: (1) performance indicators for RMLs, (2) RML network configuration, (3) content and format for future RML Directors' Meetings, (4) basic services and priorities, (5) communications between NLM and RMLs and among RMLs, (6) RML funding sources and competitive contracting, and (7) RML/NLM roles and responsibilities [101].

The task forces continued their planning efforts after the April 1979 meeting, reporting and discussing their activities at subsequent RML Directors' Meetings. Some of the developments resulting from these deliberations included the acceptance of a standardized document delivery statistical reporting form; rotating RML Directors' Meetings to various RML headquarters locations rather than just holding them at NLM; and a productive dialogue on the content and structure of the meetings. The most far-reaching impact, however, arose from the discussion on the RML network configuration. By 1981, after much consideration and largely in response to the fiscal pressures created by reduced MLAA funding, NLM announced its intention to reconfigure the network and reduce the number of regions from eleven to seven. RFPs for three-year RML contracts for the new regions were issued in early 1982, and new contracts were to be awarded on a phased schedule later that year [102].

Programs and Services

Interlibrary Loan

Health professionals and librarians throughout the country responded enthusiastically to the "free" interlibrary loans proposed in the 1965 MLAA. Table 4 clearly indicates the significant growth in interlibrary loan traffic funded by RML contract/grant funds and by NLM from the beginning of the RML network through 1982. The net result was that provision of subsidized interlibrary loans threatened to consume all available RML funds, leaving little for other essential programs and services. It therefore became necessary to consider ways to control interlibrary loan costs without sacrificing what was clearly an important function.

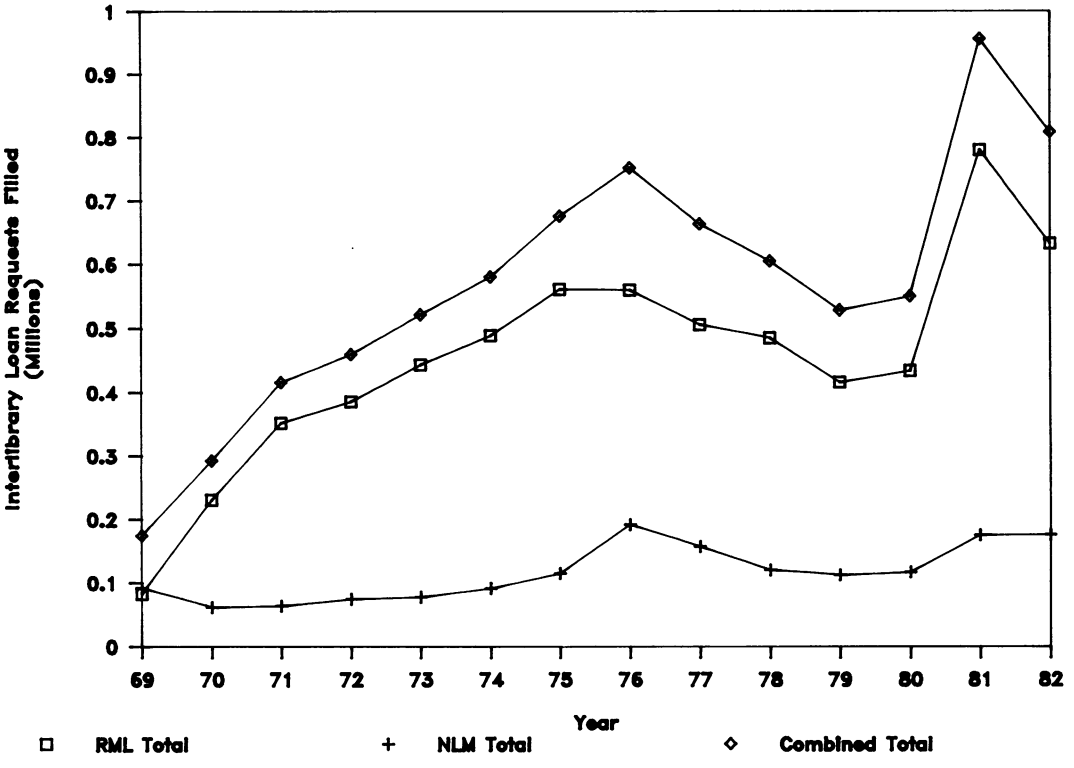
As described previously, initial controls came in the form of quotas on the amount of subsidized service, and restricted title lists. These controls were not readily accepted in all regions, so the institution of quotas and implementation of restricted title lists varied. However, in an effort to control costs, NLM announced that renewed RML contracts would require such measures by the end of 1974.

At the June 1972 Board of Regents meeting, NLM proposed another approach, in use in some regions, which NLM called the "net lender" concept. "Each level of the hierarchy will have to assume fiscal responsibility for the major support of its own constituency. NLM will provide support for the network operation and management and will underwrite the difference (net lender) between levels of service given to a lower level and received from a higher level in the hierarchy" [103:7]. Although the net lender concept was discussed in

TABLE 4

RML/NLM FUNDED INTERLIBRARY LOANS

1969–1982



many forums, it was never officially adopted as policy. Some of the principles inherent in the concept were, however, included in future regional interlibrary loan plans. That is, libraries which lent more than they borrowed were repaid in some fashion. One example occurred in MRML where consortia of libraries were provided with incentives and bonuses, such as an increase in the number of subsidized interlibrary loans they could request from the RML, as a reward for sharing resources locally.

Despite efforts to control the number of interlibrary loan requests processed through quotas and restricted title lists, the number of institutions requesting materials continued to increase. Thus, the number of loans handled by the RMLP grew disproportionately to available funding. It therefore became necessary to consider other cost-sharing measures.

At the May 1975 RML Directors' Meeting, James F. Williams, KOMRML director, proposed that contract funds be used to support the referral service provided by the RLs, and that the cost of interlibrary loans filled locally or by the RLs be borne by the borrowing library [104]. In June 1976 NLM proposed to the RML directors that libraries be responsible for the cost of loans from a core of journal titles (defined as the last ten years of all English language periodicals indexed for *Index Medicus*), and the RML contract funds would cover the cost of loans from other journals, as well as book and audiovisual loans. NLM's proposal met vigorous resistance from RML directors and regional advisory committees which felt that the plan would penalize the smaller libraries, which had the greatest need to borrow core titles [105].

NLM also proposed, at the June 1976 RML Directors' Meeting, that a national cost-sharing plan be adopted. The RML directors expressed concern that a national uniform plan was not feasible given regional variations [105]. It was nevertheless apparent that some sort of cost-sharing measures had to be implemented.

After extensive and frequently heated discussion over several years each region had the option of selecting a cost-sharing document delivery plan from one of two models developed by NLM and the RML directors. The models had two elements in

common—a national maximum user fee based on an interlibrary loan cost study, and an understanding that contract funds would cover interlibrary loan network management costs. The two models were [106]:

1. The cost of loans filled within a defined geographic boundary (state or Health Service Area) would be the responsibility of the borrowing library; loans filled by out-of-state libraries would qualify for contract funding.
2. The cost of loans filled within the region would be the responsibility of the borrowing library; contract funds would cover the cost of processing referrals.

The national maximum charge for interlibrary loan requests filled was set at $5.00 in February 1978, and each region began to implement its individual plans. Most regions phased in the cost-sharing aspects of their plans over several years; by 1980 all plans were in effect.

Throughout this ten-year period, some attention was paid to the cost [107] of providing interlibrary loan service, and the characteristics of the service. PNRHSL instituted an automated interlibrary loan reporting system which yielded valuable data on all transactions. The reports generated provided information on PNRHSL's performance in handling interlibrary loan requests, and on which titles were requested, how frequently, and by whom [108]. KOMRML noted that the number of institutions using RML interlibrary loan services increased by over 200% between 1968 and 1972, despite the imposition of curbs on subsidized service [109].

Union Lists and Catalogs

Union lists of serials were an integral part of several regions' programs since they facilitated the location of serials for interlibrary loan purposes. Regions II, VI, VIII, and IX all had lists, and Region V had one under development. Regions I, III, VII, X, and XI all relied on the serials lists of the RML headquarters libraries, although in several of these regions union lists of hospital library holdings were in existence or under development.

As interest in the development of union lists grew, so did concern for the lack of a standardized approach and the amount of funds consumed. Agreement was reached among NLM and the RML directors that newly created union lists should utilize the Union Catalog of Medical Periodicals format, thus laying the groundwork for an eventual national union list. There was little agreement, however, between NLM and some RMLs about whether MLAA funds should be used to develop regional union lists. At its June 1971 meeting the NLM Board of Regents stated that it did "...not favor...the funding of multiple incompatible union lists containing detailed information on the serial holdings for limited geographic areas" [88]. Several RMLs which had been planning union lists were thus unable to proceed.

At the October 1971 RML Directors' Meeting NLM presented plans for a "National Index of Substantive Biomedical Serials," which would include approximately 5,000 live biomedical titles, and would be built on the Union Catalog of Medical Periodicals database [110]. The creation of this list would provide access to information on the holdings of all RMLs and RLs for the nation's health sciences libraries.

In 1973, NLM developed the SERLINE (*Serials Online*) database, which initially included information on serials owned by NLM, but was eventually expanded to include holdings information for all RMLs and most RLs. A SERLINE Task Force, with representatives from each region, was appointed by NLM in 1979 to assist in the development of a national serials holdings database. Region XI RLs, as part of the PSRMLS Cooperative Serials Acquisitions Program (COSAP), experimented with the online addition of information to the SERLINE database [111].

NLM announced, in 1981, plans to develop a National Biomedical Holdings Data Base (NBHDB) which was to include location and holdings information for monographs, audiovisuals, and serials. The first step would be the creation of the National Biomedical Serials Holdings Data Base (NBSHDB). The RMLs were responsible for coordinating data collection and input from all interested libraries in their regions. The data were then submitted by the RMLs in machine-readable format according to specifications designed by NLM [112].

Despite the prohibition on the use of contract funds for union catalogs of books, there was significant interest in their creation. Several regions maintained, at their own expense or with grant funding, card catalogs into which were filed main entry cards submitted by resource libraries. In the TALON region the card file was microfilmed and made available to the contributing libraries, thus increasing accessibility to the information [54]. Such efforts were extremely time consuming and expensive, especially when compared to number of requests for books on interlibrary loan. On average,

only 10% to 15% of the total interlibrary loan traffic consisted of book requests.

The Midwest Region was awarded an NLM grant to conduct a cost-benefit analysis of the Midwest Union Catalog of Books, which included over 260,000 titles from forty-three contributing libraries. The authors concluded that the cost of maintaining the catalog was high when compared to the low volume of requests, and recommended that long-term plans be made to utilize existing or developing computerized union catalogs of books (e.g., OCLC). The present catalog would be maintained at minimal levels until suitable computerized databases became available [113]. The Midwest Medical Union Catalog was in fact discontinued in 1979 in favor of an online union catalog of monographs and audiovisuals, mounted as a private database by Bibliographic Retrieval Services, Inc. (BRS). The MHSLN contract supported the development and testing of this catalog [114].

MEDLARS/MEDLINE

In 1970 the first online version of MEDLARS, AIM-TWX was tested, marking the beginning of a new era in bibliographic retrieval. By 1971 it was evident that the MEDLARS search formulation stations would eventually be phased out, as MEDLINE became operational. Clearly, there was a need to speed and improve access to the MEDLARS database, as this service was becoming increasingly popular among health professionals.

MEDLINE officially became available in October 1971. Initially, only a few search centers were given access to the system, since it was unclear how many simultaneous users could be supported on the NLM computer. The RMLs and certain RLs were among the first to be granted access and send staff for training, eventually BHSLs were added to the system [115]. In some cases these BHSLs formed consortia to share one MEDLINE search code, thus increasing the number of institutions with access to the system [116]. Training classes were held at NLM and at PSRMLS, which contracted to provide training to searchers primarily from the western part of the country.

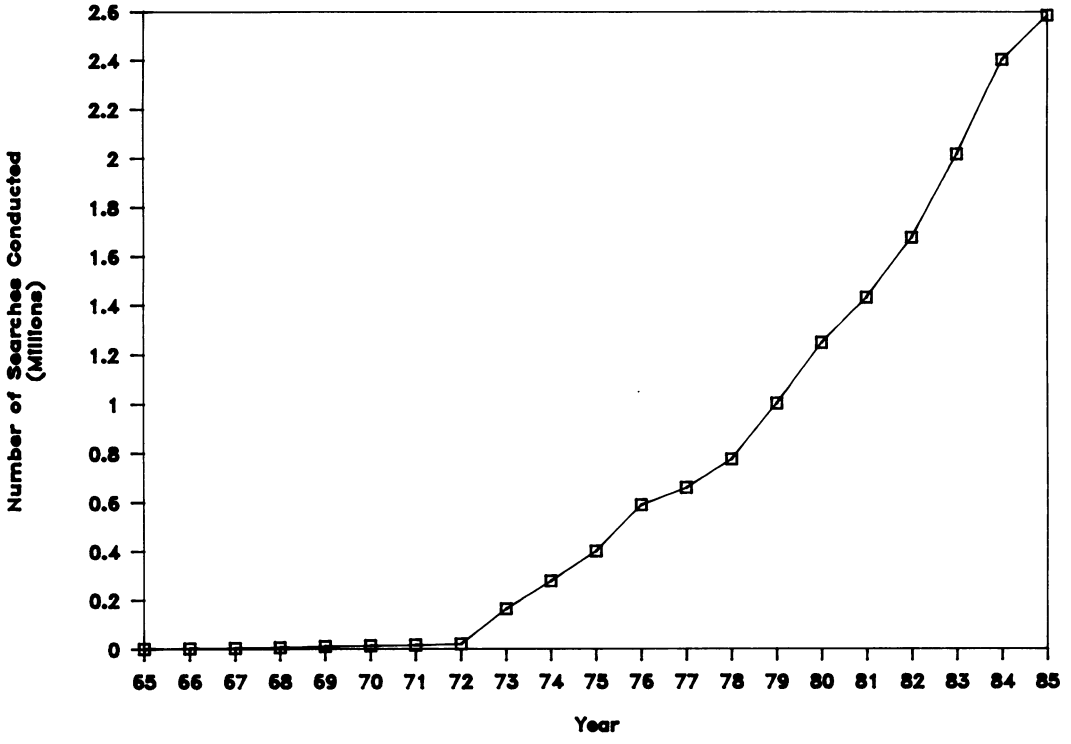
In February 1973 NLM called a special meeting of the RML directors to announce the imposition of MEDLINE user charges. It was proposed that the search center pay for the access and search costs; NLM would continue to fund the creation, maintenance, and operation of the system. The proposed rate was $6.00 per hour, to take effect July 1, 1973. The institution of charges was delayed somewhat by the federally imposed price freeze of 1973, but did become effective August 20, 1973. Many MEDLINE search centers found it necessary to pass on these costs to the user, prompting NLM to propose a maximum charge of $5.00 per search. After considerable negotiation with RML directors, the maximum charge was set at $7.50 per request, effective March 1, 1974 [117].

The implementation of MEDLINE search services in local libraries did create some network management problems because NLM was entering into independent agreements with libraries to provide a service which was to be coordinated by the RMLs. At the June 1974 RML Directors' Meeting a report prepared by a subcommittee of RML directors on the "Role of the Regional Medical Library in On-Line Search Operation" was discussed. The issues identified were: (1) responsibility for location and designation of MEDLINE centers; (2) definition of the user of the MEDLINE system; (3) quality control of MEDLINE searchers; (4) continuing education of the MEDLINE searcher; (5) publicity; and (6) management data. The subcommittee cautioned that a MEDLINE search network operating independently of the RML network could significantly weaken the latter [118].

A subsequent report of the RML-NLM Working Committee on On-Line Network Management outlined the responsibilities of both NLM and the RMLs in management of the online network. RMLs were primarily responsible for coordinating and monitoring the online network within their regions, including publicity, continuing education, and provision of backup MEDLINE service. NLM was responsible for maintenance and development of the databases, providing technical information and initial training, and national coordination of publicity and continuing education. It was agreed that it was not possible to establish and enforce criteria for the selection of online searchers. Instead efforts would be directed to providing continuing education opportunities to update the knowledge and skills of all searchers [119].

The continued development of the MEDLINE network greatly facilitated and improved the delivery of bibliographic citations to health professionals. Tables 5 and 6 illustrate the tremendous growth in the number of MEDLINE searches conducted, search stations, and searchers trained. The management of this evolving network added considerably to NLM's and the RMLs' scope of responsibility. The RMLs encouraged and identified BHSLs which would benefit from on-site MEDLINE capabilities and distributed MED-

TABLE 5
DOMESTIC SEARCHES OF MEDLARS DATABASES
1965–1985



LINE application packets for submission to NLM.

Significant changes were made in the training program for MEDLINE searchers. By 1976 the three-week training program was revised to be one week of initial training, followed several months later by one week of advanced training. Pressure also mounted to hold training courses at sites other than just NLM and UCLA (PSRMLS), so instructors traveled to various regional sites. In 1981 the Midcontinental RML became the third online training center, primarily serving the midwestern states.

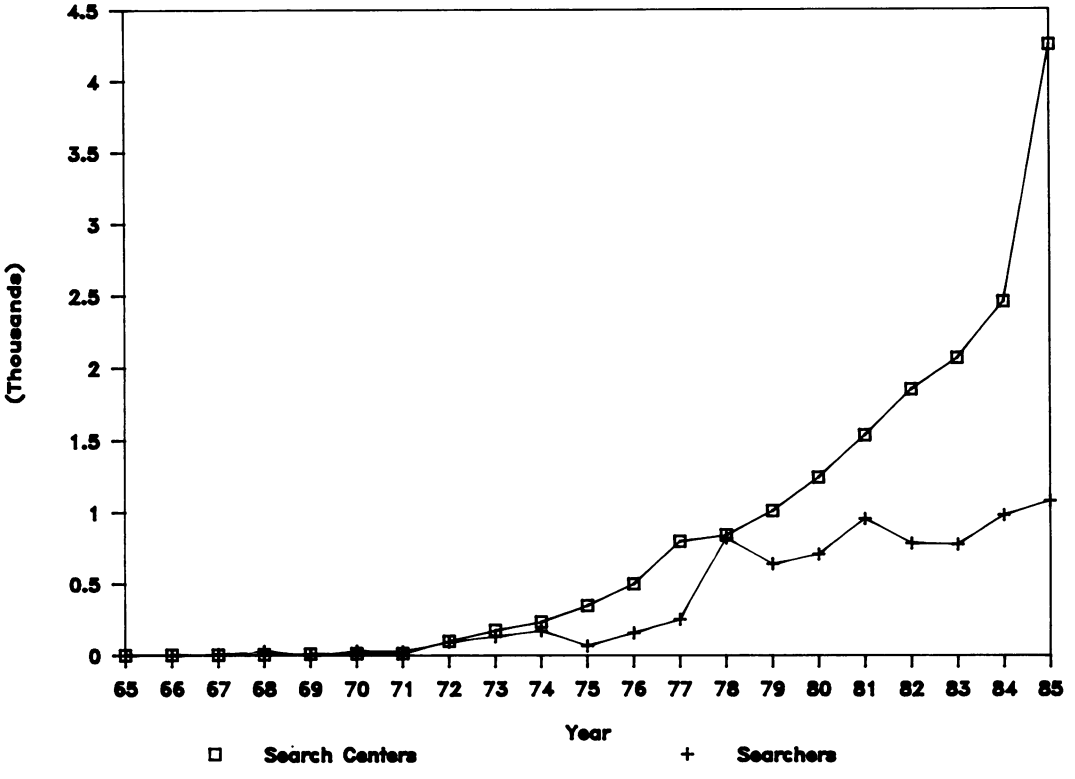
As the number of trained searchers grew, and as it became imperative to organize a formal means of alerting them to system changes and capabilities, NLM began to issue its *Library Network/MEDLARS Technical Bulletin* in 1969. The RMLs also issued occasional publications designed to update searchers, or included online search information in their newsletters. In 1977 a Standing Committee for On-Line Retrieval Education (SCORE) was established by NLM to select topics for continuing education courses for online searchers, to identify possible instructors, and coordinate online continuing education. SCORE recommended that trained searchers be provided with annual updates on system and databases changes and search techniques. Each region subsequently designated a Technical Resource Person (TRP) who was responsible for providing these annual updates using course content designed by NLM staff.

Reference Services

Each RML, in cooperation with its RLs, continued to provide backup reference services, with every effort made to answer questions locally prior to requesting information from regional resources. The amount and type of service varied between regions, and there was no effort to set up a national referral system between the RMLs and NLM for difficult reference questions.

In 1974 an RML-NLM Working Committee on Reference Services reviewed the status of regional reference services and recommended continuation of this backup reference support. The committee also suggested that instruction in the provision of

TABLE 6
MEDLARS/MEDLINE SEARCH CENTERS/SEARCHERS TRAINED
1965–1985



reference services be given by the RMLs as part of their regional training programs [120].

Resource Sharing

Several innovative programs designed to share information resources and coordinate the development of regional collections were instituted by the RMLs. Of direct benefit to basic unit libraries were serials duplicate exchange programs, which provided free or inexpensive individual issues or entire runs of serials. Most RMLs promoted the exchange of duplicate serial issues on an informal basis, but two regions, TALON and PNRHSL, operated formal, coordinated programs [121,122].

TALON also developed a serials rationalization program. The libraries which contributed holdings to the *TALON Union List of Serials* agreed to maintain subscriptions to certain serials thus insuring that a core set of serial titles was available within the region [54].

An RML-NLM Working Committee on Cooperative Acquisitions and Cataloging, Serials Rationalization, Resource Sharing and Cooperative Storage, formed in 1974, discussed the network's role in these activities. It recommended that each region develop and maintain book, journal, and audiovisual resources adequate to meet most of its immediate needs, and that it was cost-effective to do so in a cooperative fashion. Cooperative serials acquisitions programs should receive highest priority, and should be coordinated into a national resource. Consideration should be given to developing CATLINE (*Cat*aloging On*line*) into a national locator system [123].

A number of interesting cooperative acquisitions programs were developed by the RMLs. PSRMLS coordinated a Cooperative Serials Acquisitions Program (COSAP) [111] in which each of the RLs committed itself to maintain subscriptions to specified journals which were held by fewer than three libraries in the region. In 1979 TALON instituted a cooperative acquisitions program for monographs to complement its serials rationalization program. Each of the eleven RLs in TALON accepted

responsibility for purchasing all books published in appropriate subject fields by an assigned publisher(s) [124,125].

The development of formalized hospital library consortia to promote the sharing of resources, first proposed by Fink, Bloomquist, and Allen in 1974 [126], was encouraged by the RMLs and NLM. Such cooperative arrangements frequently resulted in increased self-sufficiency without extensive financial drain on individual institutions. In many areas formal consortia primarily involved hospital libraries, but also included corporate, community college, nursing, and medical school libraries. Activities common to these consortia included document delivery, MEDLINE search services, cooperative acquisitions projects, education and training of consortia members, and union list development [127–132]. In some communities health sciences libraries also cooperated with public libraries for the provision of consumer health information materials [133,134].

In some regions the RLs or state university libraries received funding to improve health sciences library services in their geographic area. With funding from an NLM Resource Project grant, the MCRMLP worked with the Wyoming College of Human Medicine and the University of Wyoming Libraries to develop a medical information network in Wyoming. Twenty-nine hospitals were organized into six consortia, and provided with core health sciences library collections. Consulting and training services were provided from within this subregional network [135]. Resource Project grant funding also assisted the development of a project at the University of Maine to provide information services to rural hospitals [136].

Consulting and Training Services

Considerable progress was made in the development and implementation of regional consulting and training services. The methodology for providing such services varied considerably, influenced in part by the organization of the region. In general, centralized regions were able to institute these services most readily, since they relied primarily on RML staff funded by the RML contract. NERMLS led the way; in 1968 its staff worked closely with Dr. Norman Stearns, director of the Postgraduate Medical Institute (PMI), to identify a core list of books and journals which should be available in any hospital library [33]. NERMLS then contracted with PMI to contact hospitals and introduce the concept of developing and maintaining such a core library, under the supervision of a library manager. In order to acquaint the generally untrained library managers with network operations and library management techniques, NERMLS developed a week-long Library Training Institute (LTI). The LTIs were held at the Countway Library in Boston and each lasted a full week [137]. The experiences gained in training hospital library managers also prompted Harold Bloomquist, NERMLS director, to collaborate in the editing of *Library Practice in Hospitals,* a text for "... untrained, probably newly employed, individuals who find themselves supervising the hospital's library and do not know where to begin" [138:xiii].

In its first years of operation PNRHSL field librarians visited hospital libraries in the region on a rotating basis. Such visits provided the RML with valuable information on regional needs, and served to publicize its services. A one-day workshop on hospital library management was held at various locations throughout the region [108]. PNRHSL also secured grant funding to establish director of biomedical communications positions in Idaho and Montana, each of which lacked a medical school library. The directors assisted with health sciences library development in each state.

Several other RMLs, including MERMLS and PSRMLS, also conducted one- or two-day workshops throughout their regions, and provided individual consulting services on demand. To facilitate its consulting and training activities, PSRMLS published *Manual for Librarians in Small Hospitals* [139] which was subsequently used in several other regions including TALON and MARMLS.

Decentralized regions designed consulting and training programs which were offered by RL staff. Initially such programs were grant funded. In the Midwest Region, library coordinator positions were funded in each of the six states. The coordinators began by providing both consulting and training services, and became particularly involved in the development of health sciences library consortia. They produced a loose-leaf training manual entitled *Basic Library Management for Health Science Librarians* [140] which could be used in different educational settings. In Wisconsin an alternate mode of delivery was employed, and courses were taught via the state's Educational Telephone Network [141].

KOMRML received assistance from staff in each of its participating libraries to provide extension services [142]. The RLs in the TALON region were awarded grants to provide extension services; at the conclusion of these grants, services were

continued by some of the RLs, albeit on a reduced level [54].

It should be noted that in several regions the RMLs cooperated with RMP library projects to develop materials of use in consulting and training services. This was particularly true in the New England, Mid-Atlantic, and Pacific Southwest regions.

The extent of consulting and training services varied considerably among regions, due in part to the fact that in some regions such services were not funded by the RML contract. At the December 1974 RML Directors' Meeting the RML Working Committee on Training, Continuing Education, and Extension Services recommended that all funding for such services be via the contracts mechanism, and that training opportunities be available in all regions. They further recommended that NLM assume responsibility for a clearinghouse of educational materials developed by the various RMLs [143].

In addition to offering basic courses designed to teach untrained library managers the principles of organizing a small library and providing basic services, most regions developed specialized courses on topics such as the formation of consortia, the management of audiovisuals, and administrative techniques. PSRMLS developed a series of manuals for use in these courses [144–146]. MERMLS invited selected hospital librarians from throughout Region III to a leadership institute designed to prepare them to provide regional extension services in their geographic area [147].

As the educational services offered by the RMLs increased in scope and magnitude, and library staff in each region welcomed educational opportunities provided locally, it became obvious that the RML's role in this area required clearer definition. Most critical was the division of responsibility among the RMLs, NLM, and the Medical Library Association (MLA), which had a well-established continuing education program. In July 1978 a position paper delineating the responsibilities was issued by MLA. MLA would serve as primary provider for educational activities at the "professional" level, the RMLs would concentrate on the "untrained" library managers, and NLM would be responsible for training MEDLINE searchers and regional audiovisual consultants [148].

It was agreed that the RMLs might on occasion provide professional training if MLA did not have a current or planned educational program. An example of professional training coordinated by the RMLs and NLM occurred in 1980 when the RMLs selected catalogers from each region to attend a training session at NLM on the changes in cataloging rules described in the second edition of the *Anglo-American Cataloguing Rules* (AACR2) [149]. These catalogers subsequently taught regional workshops attended primarily by professional librarians.

Another issue discussed during this period was the relationship of RML consulting services to the medical library consultant first mentioned in the 1978 Joint Commission on the Accreditation of Hospitals (JCAH), "Standards for Professional Library Services" [150]. It was agreed that RML consulting services were designed to provide initial evaluation and advice on hospital library services, but would not substitute for the formal, on-going consultant services required by the JCAH in a hospital where a professional medical librarian was not on the staff.

Several RMLs gathered data on the hospital libraries in their regions in an attempt to measure development and impact of RML services. An evaluation of the training program in the Midcontinental Region reported that attendance at workshops encouraged library managers to provide new services to health professionals, and assisted in the improvement of existing services [151].

KOMRML developed a formalized documentation process to gather baseline data [152]. The data showed that the libraries which had regular contact with KOMRML extension librarians provided more sophisticated administrative, public, and technical services and became more active network participants than did libraries without such contact. It was not possible to correlate this positive development with the extension services provided, but valuable baseline data were gathered which might prove useful in future evaluations [153].

PSRMLS analyzed the development of hospital libraries in Region XI over an eight-year period, 1971–1978. The data demonstrated that there was definite improvement in hospital library activity in three critical areas: appropriate staffing, collections, and the availability of services. As with the KOMRML study, it was not possible to demonstrate that the library improvement was a direct result of PSRMLS involvement. However, the hospitals which showed some of the strongest development were those that had used PSRMLS services most heavily [154].

Grants

In December 1972 the Biomedical Library Review Committee (BLRC) issued guidelines deal-

ing with interactions between the RMLs and the BLRC regarding both Resource and Regional Medical Library grant applications. For RML grants, the applications would be required to include a statement by the RML director on how the grant-funded project related to the region's plan. RML directors were also requested to work closely with applicants for resource grants, and to comment, once the grant application was submitted, on the relationship of the project to regional plans [155]. RML directors agreed to provide such commentary, although there was some concern that they were being asked to judge applications without benefit of a thorough analysis of the proposed project.

By late 1974 procedures for RML interaction in the grant process were formalized. In addition to commenting on proposed projects, the RMLs were responsible for distributing grant application packets, thus establishing a definite RML role in the application process.

The NLM Resource Improvement and Project grants were extremely useful in promoting library development on a regional level. RML staff encouraged institutions interested in developing their library service to apply for appropriate grants, and often reviewed drafts of the applications.

The Resource Improvement grants, which from 1971 to 1975 provided one-year awards of a maximum of $3,000 to establish a basic library collection, provided a much needed incentive to many institutions. An evaluation of this program by Matheson and West [156] revealed that the grants did stimulate library development. The study also included a recommendation to modify the grant program to support applications by consortia of libraries. In 1975 the Resource Improvement Grant guidelines were revised: up to $4,000 could be requested in the first year to plan consortium activities; in the second year each institution in the consortium could receive up to $3,000 for collection development, provided it matched the amount awarded on a three to one ratio.

Audiovisual Services

In October 1973 an *Ad Hoc* RML Committee on Requirements for a Training Program for RML Media Consultants met to discuss the need for media consulting services in each region. It recommended that two individuals from each region be trained to serve as media consultants to promote increased use of non-print materials. The committee designed a four-week training program which could be taught in one-week segments. The first of these training sessions was held at the National Medical Audiovisual Center (NMAC) in Atlanta in July 1974 [157].

An RML-NLM Working Committee on AV and CAI Networks discussed the interrelationships between NMAC and the RMLs. Of particular concern was the development of the AVLINE (*A*udio*v*isuals On*line*) database. It was agreed that the RMLs and NMAC would cooperate in the development of AVLINE, the provision of AVLINE access and audiovisual software, and the development and provision of audiovisual consulting and training services [158].

The initial cadre of audiovisual consultants trained at NMAC was supplemented in 1976 by a second trained consultant for each region. Updates for the experienced consultants were also scheduled in 1976, and by late that year each region was charged with formulating an audiovisual plan. Although there was some initial confusion over the exact role of the audiovisual consultants, a common understanding emerged. The audiovisual consultants developed and taught workshops on establishing audiovisual collections, services and facilities, and were available for individual consultations. In some regions they actively promoted sharing of audiovisual programs via interlibrary loan mechanisms, and the creation of audiovisual union lists.

In January 1981, NLM provided each region with a satellite collection of 300 videocassettes from NMAC's collection. The titles were available for interlibrary loan within each region, so that libraries could preview titles before purchase. NLM's total collection of over 1,000 videocassette titles was also available for loan.

Regional Planning, Evaluation, and Research

The RMLs conducted a great deal of their planning via their advisory committees. In some cases, subcommittees were appointed to discuss specific problems or plan programs and services. In addition, various working committees composed of RML directors, associate directors, and other NLM and RML staff considered national issues. These working committees, as mentioned previously, were formed to establish national network goals in specific program areas. NLM intended that each region would then develop regional plans to meet these goals.

TALON planned several research programs during its first years of operation to investigate user needs and improved means of information delivery. An automated statistical interlibrary loan package

called NEMIS (Network Management Information System) was developed, but was never implemented because preparation of data for input at each RL was not cost-effective. Another study determined that it was not feasible to centralized purchasing, processing, and cataloging of library materials for the RLs. The Houston Academy of Medicine-Texas Medical Center Library conducted a study to determine the cost of various library services, which yielded valuable information of potential use to the network [54].

In an effort to assist the RMLs in the development of regional plans, as recommended by the evaluation consultants in 1974, NLM requested expressions of interest from RMLs wishing to develop a model planning process. The Midwest Region designed a program planning model (PPM) with the assistance of two professional planners from the University of Wisconsin. The PPM involved key reference groups, including consumers and participants in the MHSLN, in the development and evaluation of network services. Both Delphi and nominal group techniques were used to elicit information [159,160]. MERMLS developed a "plan to plan" [104]; a significant recommendation from this process was that the "...RML role shift to being managers of information flow and distribution rather than serving as sources of information..." [161:14]. MCRMLP surveyed its Advisory Committee to establish priorities for the Midcontinental RML activities and services. Document delivery was ranked in first place, followed by information services, a category which included computerized bibliographic services such as MEDLINE and reference services. Also important were technical, educational, and consultation services [162]. In KOMRML an examination of the governance structure resulted in the addition of BHSL representatives, with full voting rights, to Region V's Executive Committee [163].

The development of formal, published regional plans varied among regions, since some RML directors were reluctant to write a plan without specific information from NLM on the essential elements of a plan. NLM did not provide written guidelines until 1982 when it issued the Request for Proposal (RFP) at the time of network reconfiguration.

Relations with Other Networks and Programs

NLM and the RMLs maintained close working relationships with RMPs through 1973, when all funding for RMP projects ceased. To gain support for RML programs and plans from academic health sciences center deans, NLM prepared a "white paper" on RML network development for discussion at the Association of Academic Medical Colleges (AAMC) Council of Deans meeting in 1973 [164]. Meetings were also held with officials of the Veterans Administration to discuss VA participation in the RML and Biomedical Communications Network.

The RMLs recognized the importance of working closely with existing networks and organizations in their regions to coordinate services [165]. A notable example was the interrelationship between the NY/NJ RML and the New York State Interlibrary Loan (NYSILL) program, a state funded interlibrary loan program providing interlibrary loan access to research library materials throughout the state. By agreement, health professionals without access to health sciences libraries could obtain needed material via their public library. The RML agreed to honor requests submitted by the New York State Library, and RML network libraries also benefited by being able to request needed non-medical research materials through NYSILL [166].

The RML-NLM Working Committee on Network Interface/Document Delivery addressed the need for coordination of document delivery activities in areas where state funding for document delivery services was available. The committee recommended that formal planning to develop a model coordinated system be undertaken, and suggested that the MHSLN submit a proposal to NLM for such a study [167]. MHSLN made arrangements with two state interlibrary loan networks, the Wisconsin Interlibrary Loan Service (WILS), and the Illinois Library and Information Network (ILLINET), to refer requests between the MHSLN and the WILS and ILLINET networks [168].

The newly emerging Area Health Education Centers (AHECs), which were charged with the provision of training and continuing education of health professionals in underserved areas of the United States, provided a new arena for cooperation. NLM and the Bureau of Health Manpower, which administered the AHEC program, undertook a project to inventory AHEC library projects throughout the country and identify AHEC information resource needs. The study revealed that AHEC activities resulted in significant information needs, but that library and information services were usually not considered in AHEC programs. NLM EMP staff therefore initiated discussions with appropriate AHEC funding agencies to

delineate responsibilities for program funding, and to coordinate information services activities [169]. In some AHECs extensive library programs were undertaken, supplementing the RML network's efforts to develop and facilitate access to health information sources for health professionals [170–176].

Formal relations with state library agencies were established in 1976 when the *Ad Hoc* Committee to Study the Relationship Between State Library Agencies and Health Information Libraries was established by the Association of Specialized and Cooperative Library Agencies (ASCLA), a section of the American Library Association. The committee determined that state libraries and the RMLs did not have good channels of communication, and were generally unfamiliar with one another's services and programs. Representatives from state libraries, NLM, and the RMLs proposed that informational meetings be organized in each of the eleven regions. Meetings were subsequently held in the TALON, Pacific Northwest, and Midwest regions [177], while other RMLs appointed state library directors to their advisory committees, thereby establishing a continuing communications link. MERMLS participated as a member of the Council of Pennsylvania Library Networks, established by the Pennsylvania State Library to promote cooperation among networks, cooperatives, and consortia [178].

Technological Developments

NLM and the RMLs readily adopted technological developments in order to improve or speed access to information. In 1976 NLM began to develop DOCLINE (*Doc*uments On*line*), an automated interlibrary loan request routing system which would also provide accounting and statistical data on the national interlibrary loan traffic. DOCLINE would interface with a single, national serials holdings file (eventually named SERHOLD), which would provide the necessary information for routing requests to a library owning the needed title, and with the MEDLARS bibliographic files, eliminating the need to key in journal article citations [161]. Full implementation of DOCLINE on a national level was delayed until 1985, but the RMLs provided design input during the developmental phase, and assisted in gathering information for the serials locator file.

MCRMLP, which had access to PHILSOM (*P*eriodical *H*oldings *i*n *L*ibraries *o*f *S*chools *o*f *M*edicine), an online serials holdings file created and maintained by Washington University in St. Louis, developed Octanet in 1980–1981. By early 1982, Octanet was providing automated routing of interlibrary loan requests between libraries in the six states of the MCRMLP. Eventually, an automated link was developed between Octanet and the DOCLINE system in use internally at NLM. Octanet also facilitated union list production for library consortia, and provided an electronic messaging capability. Octanet development and use costs were supported by the MCRMLP contract until January 1983, when user charges were instituted [179–181]. Octanet proved to be more cost-effective than other forms of interlibrary loan request transmission such as mail, the OCLC interlibrary loan subsystem, and TWX, and significantly reduced the transmission time for requests which had to be sent to more than one library. It also provided useful management reports and statistics [181].

In an effort to speed delivery of the document itself, some regions experimented with telefacsimile transmission between health sciences libraries [182]. Although such transmission had the potential of greatly reducing the elapsed time between requesting and receiving a document, the cost and various operational deficiencies prevented widespread adoption of this technology.

Publicity and Publications

Regional publicity was accomplished primarily through the publication of RML newsletters (Appendix 3) on a monthly, or, as funding decreased, quarterly basis. The recent acquisitions lists issued in the early days of the program were discontinued as a cost-saving measure. In addition, most RMLs developed brochures and posters describing and advertising regional services. The *National Library of Medicine News* included a series of articles on the RMLs, describing the unique features of each region to a national readership [168,178,183–202]. Full-length articles in health professional and library publications also served to provide information on the accomplishments of the RML program [203–208]. In addition, RML exhibits were mounted at health professional meetings, in an increasing effort to reach health professionals directly. A very popular feature at RML exhibits was the online demonstration of MEDLINE.

Network Evaluation

RML Evaluation—1972–1974

The 1972 report of the BLRC's RML Committee recommended that the RML program be evaluated periodically. Later that same year, NLM appointed a committee of RML Evaluation Con-

sultants. This committee organized site visits to each of the eleven RMLs by consultation teams composed of representatives of the BLRC, the Board of Regents, health and library professionals, key NLM staff, and an RML director. The visits took place between November 1972 and February 1974.

During the site visits, the consultation teams met with RML staff, administrators from the RML institution, and representatives from RML user groups, including both librarians and health professionals. Individual reports for each RML were issued by the site review team, including recommendations for improvements and changes in the various programs and services. Most pertinent were the recommendations and comments which applied uniformly to each of the eleven RMLs.

The site visitors concluded that in each region the document delivery system was operating "...to a most satisfying degree of efficiency and effectiveness" [209:4]. It was noted that the services most in need of expansion in the coming years were outreach programs, including consultation and training; communications in the form of publications; and resource sharing efforts, such as cooperative serials acquisitions and retention programs.

The regional boundaries as constituted presented no real difficulties, but flexibility was encouraged whenever traditional boundaries differed from RML lines. Teams found considerable talent and leadership among RML staff, and the institutional support for the RML headquarters library was firmly based. It was felt, however, that nearly all the RML advisory committees needed to be restructured or revitalized. This was particularly important in light of regional planning efforts, where advice from a broad range of network participants was essential. Communication between RMLs should also be strengthened and improved.

Each RML was advised to develop a regional plan. Much of the planning to date had taken place on an *ad hoc* or informal basis, and had not involved the RML user population. NLM was encouraged to provide planning guidance by stating the goals for regional plans. The consultants recommended that RML program evaluation efforts continue, but that in the future the RML directors, accompanied by several representatives from their region, brief the evaluation consultants on regional activities and progress [209].

1977 and 1980 Evaluation Projects

In 1977 the National Institutes of Health's Office of Program Planning and Evaluation approved an NLM proposal to fund various evaluation projects proposed by interested RMLs, in addition to an NLM-conducted study on the total interlibrary loan activity provided by the RMLP. The interlibrary loan analysis indicated that only about 25% of regional interlibrary loan traffic was funded by RML contracts, and that hospital libraries received about 50% of network loans. Statistical information on the interlibrary loan traffic emanating from hospital libraries was generally not available, and it was recognized that this would be important information to gather in the future. In four regions where such data were available, analysis revealed that interhospital interlibrary loan traffic exceeded or almost equaled RML/RL interlibrary loan traffic [210]. Regional studies included further analyses of interlibrary loan data, evaluation of extension services and local library development, and the effectiveness of regional newsletters [154].

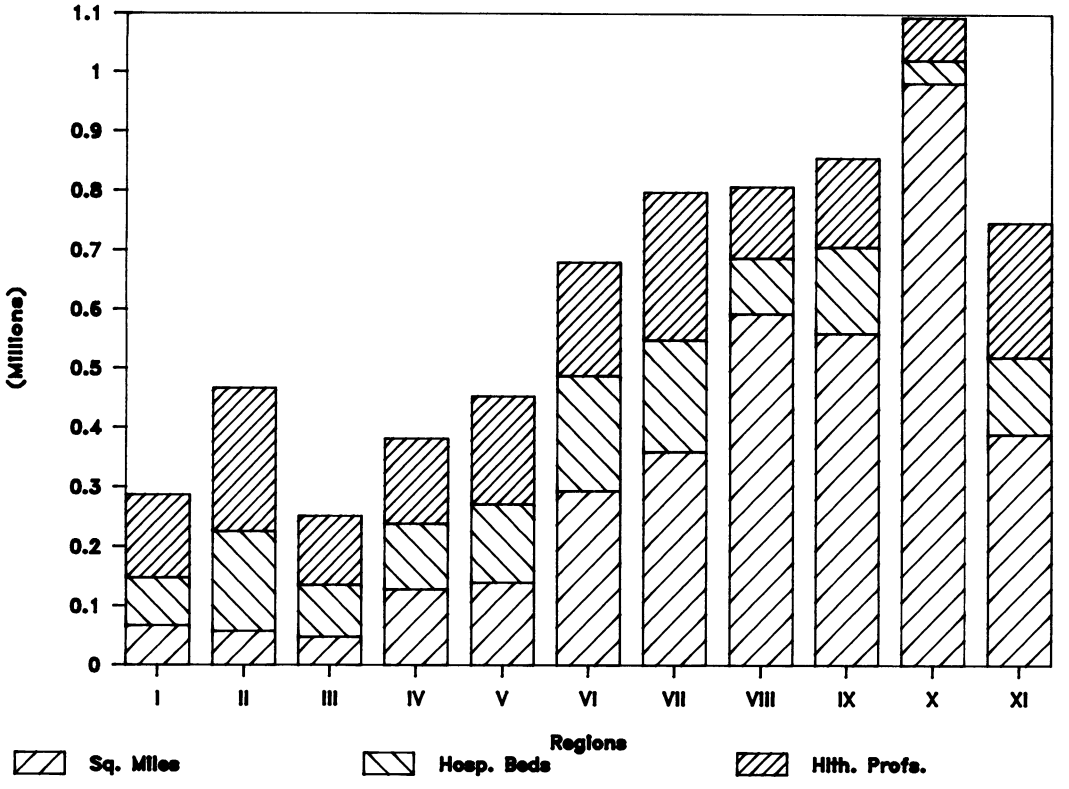
In 1980, as a direct result of the decision reached at the 1979 planning meeting to examine the RML network configuration, NLM contracted with Abt Associates, Inc. to conduct an evaluation of the RMLP. The contractor would "...review the impact of national performance standards, the effect of user charges, the implication of developing technologies and MEDLARS III, the ideal relationship between the RML network and other networks, and the soundness of a decentralized hierarchical network" [95:7]. An exploratory evaluation report, submitted in 1981, included preliminary data and the results of interviews with network administrators and library participants [211]. The evaluation contract with Abt was terminated by NLM after submission of the exploratory report. NLM had decided that changes in the RML network structure would be required in the very near future for budgetary reasons, and could not be delayed until the evaluation was completed.

Characteristics of the Original Eleven Regions

A summary of the original eleven regions, emphasizing their distinctive characteristics and major accomplishments, serves to illustrate one of the strongest features of the RML network—the development of programs and services responsive to local needs to accomplish national objectives. Table 7 illustrates the demographic diversity of each region, featuring those programs and services for which each RML is best remembered.

Region I: New England Regional Medical Library Service (NERMLS). NERMLS served a region which was geographically cohesive, contain-

TABLE 7
DEMOGRAPHICS OF THE ORIGINAL ELEVEN REGIONS
1980 DATA



ing both major metropolitan centers with strong library resources and rural states with perhaps only one strong health sciences library collection. A major focus of the NERMLS program was education, particularly for untrained hospital library managers. Both the core library collection [33], and hospital library consortium concepts [126,127] were developed and widely used in the New England Region. As the first RML, NERMLS was called upon to provide extensive advice to other regions on their organization and development of RML programs.

Region II: New York/New Jersey Regional Medical Library (NY/NJ). The NY/NJ Region contained very rich health sciences library resources in the greater New York City metropolitan area. Over 90% of the population of the region was located in urban areas. Libraries in both New York City/Northern New Jersey and throughout the state of New York had long-standing history of cooperation both at the local and state level. Not surprisingly, therefore, the NY/NJ RML is noted for strong union list programs, and for the integration or alliance of health sciences libraries with existing or developing local or statewide library networks.

Region III: Mid-Eastern Regional Medical Library Service (MERMLS). Region III encompassed the smallest geographic area of the original RMLs. The strongest health sciences library resources in the Mid-Eastern Region were located in the Philadelphia area, and approximately 70% of its population was concentrated in urban areas. MERMLS was noted for rapid and cost-effective interlibrary loan service, a strong and active reference service, a substantive newsletter from which other regions often reprinted articles, leadership institutes [147] which trained librarians in the region to provide consulting and training services in rural areas, and a high degree of user satisfaction.

Region IV: Mid-Atlantic Regional Medical Library (MARML). The Mid-Atlantic Region contained a concentration of health sciences libraries in the greater Washington, D.C. metropolitan area which had traditionally relied heavily on the resources of a great, local library—the National

Library of Medicine. Other areas of the region were predominantly rural; the strongest library resources here were the academic health sciences libraries. RML programs and services in the Mid-Atlantic region were not as identifiable as in other regions, because NLM staff who were assigned Region IV responsibilities were frequently identified with NLM rather than the regional office. Region IV relied heavily on committees of librarians to set policies, develop, and, in some cases, provide regional services.

Region V: Kentucky, Ohio, Michigan Regional Medical Library (KOMRML). As the first decentralized region, KOMRML built upon the services and expertise provided by its participating (resource) libraries. KOMRML developed a strong regional communications program, generating extensive documentation for the establishment of policies and the recording of accomplishments and future goals. The RML office served to coordinate all regional activities, thus insuring consistency of service in a decentralized program.

Region VI: Southeastern Regional Medical Library Program (SERMLP). SERMLP provided regional services via resource libraries located in primarily rural states. SERMLP staff and instructors from the resource libraries taught a variety of basic courses for library managers throughout the region, with particular emphasis on consortia development. Resource libraries assumed responsibility for several major program efforts, including MEDLARS search services and the compilation and production of a regional union list.

Region VII: Midwest Regional Medical Library (MRML). The Midwest Region included both major metropolitan areas, with strong health sciences library resources, and predominantly rural states. The state coordinators program was a model for the provision of consulting and training programs in a decentralized region, and the manual [140] developed for this purpose was widely used, including a Japanese translation prepared by the Japan Medical Library Association [212]. The Midwest Region conducted the most formal and extensive regional planning program, involving all types of health professionals and librarians. Consortia development was especially strong in this region; thirty-nine consortia with over 500 member institutions were in operation by 1978 [168].

Region VIII: Midcontinental Regional Medical Library Program (MCRMLP). The Midcontinental Region included the largest number of states (seven) in any region, covering a vast geographic area with library resources concentrated in a few metropolitan areas. MCRMLP is best noted for its sophisticated use of technology to facilitate or enhance regional services including the development of Octanet in cooperation with the PHILSOM network. MCRMLP staff were also active in the conduct of formal evaluations of regional services, such as training and Octanet, and publishing the results, and, in 1981, began to provide online training for the center of the country.

Region IX: South Central Regional Medical Library (TALON). TALON also covered a vast, primarily rural, geographic area, and operated its region with the cooperation of resource libraries. Particular emphasis was placed on the development of union lists of monographs, serials, and audiovisuals; the operation of a serials duplicate exchange program; and cooperative acquisitions programs. Emphasis was placed on continuing education for hospital library managers and a training manual, produced in 1979 [213], was used by other regions.

Region X: Pacific Northwest Regional Health Sciences Library (PNRHSL). Region X comprised the largest geographic area of any of the regions, and contained only two academic health sciences libraries. Thus, emphasis was placed on developing partnerships with state or university libraries to assist in providing health sciences library services to the region's health professionals. PNRHSL was also noted for the development of an automated interlibrary loan statistical program, and for promoting and developing standards for the collection of such statistics.

Region XI: Pacific Southwest Regional Medical Library Service (PSRMLS). Region XI included one highly populous state (California) with eight academic health sciences libraries, and three primarily rural states. Particular emphasis was placed on the development of strong hospital libraries through an extensive consulting and training program. Training manuals developed by PSRMLS were used throughout the RML network [139,144–146]. Several analyses of hospital library development in the region were conducted [154,171]. PSRMLS also served as the West Coast online training center, facilitating the development of online centers in the western part of the country.

The Reconfigured Network (1982–1985)

Network Management and Architecture

Reconfiguration of the network from eleven to seven regions was necessary primarily because the amount of funding available for the RMLP had not kept pace with costs. In contrast to the original

formation of the RML network, where the geographic composition of each region was for the most part self-determined by librarians and health professionals in the regions, the boundaries of the reconfigured regions were determined by NLM with the assistance of outside consultants [214:5]. Comments on the RML program were solicited from network participants and factored into the program review at NLM [215].

Request for Proposals

A revised RMLP mission statement delineated in NLM's Request for Proposal stated that the RMLP shall:

> Provide health sciences practitioners, investigators, educators, and administrators in the United States with timely, convenient access to health care and biomedical information resources. The Program is coordinated by the National Library of Medicine and carried out through a nationwide network of health-sciences libraries and information centers [102:3].

In early 1982 RFPs for three-year RML contracts for the new regions were issued; new contracts were awarded on a phased schedule between September 1982 and January 1983 [216]. Table 8 lists the new regions and RML headquarters; the number designations for the regions changed from roman to arabic with the reconfiguration. Table 9 illustrates each region's demographic characteristics.

Contract Awards

Four of the regions—Region 4 (MCRMLP), Region 5 (TALON), Region 6 (PNRHSL), and Region 7 (PSRMLS)—remained essentially unchanged in geographic composition, although

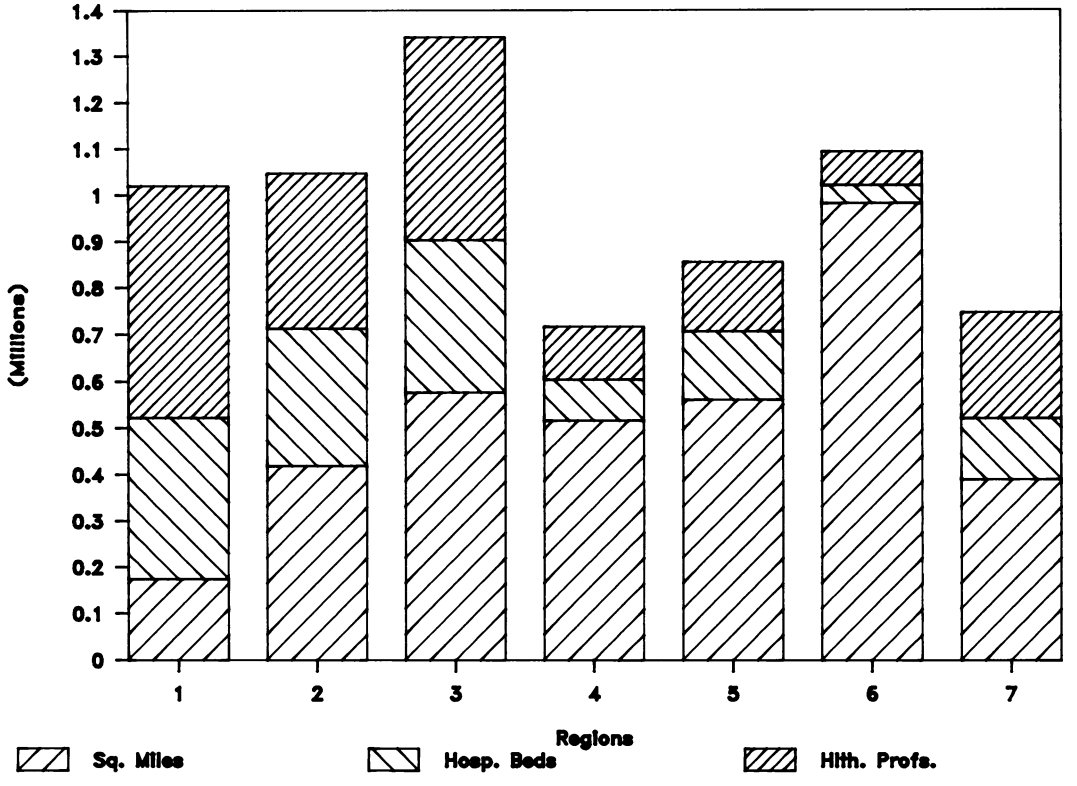
TABLE 8

RECONFIGURED REGIONAL MEDICAL LIBRARY REGIONS

Region	Regional Medical Library	Area Served	Date Operational
1	Greater Northeastern Regional Medical Library Program (GNRMLP) New York Academy of Medicine Library, New York	Connecticut, Delaware, Maine, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, Vermont and Puerto Rico	December 1982
2	Southeastern/Atlantic Regional Medical Library (SEARML) Health Sciences Library, University of Maryland, Baltimore	Alabama, Florida, Georgia, Maryland, Mississippi, North Carolina, South Carolina, Tennessee, Virginia, West Virginia, District of Columbia, and the Virgin Islands	January 1983
3	Greater Midwest Regional Medical Library Network (GMRMLN) Library of the Health Sciences University of Illinois at Chicago	Illinois, Iowa, Indiana, Kentucky, Michigan, Minnesota, North Dakota, Ohio, South Dakota, Wisconsin	January 1983
4	Midcontinental Regional Medical Library Program (MCRMLP) Library of Medicine University of Nebraska, Omaha	Colorado, Kansas, Missouri, Nebraska, Utah, Wyoming	January 1983
5	South Central Regional Medical Library (TALON) University of Texas Health Science Center at Dallas	Arkansas, Louisiana, New Mexico, Oklahoma, Texas	November 1982
6	Pacific Northwest Regional Heatlh Sciences Library Service (PNRHSLS) Health Sciences Information Center University of Washington, Seattle	Alaska, Idaho, Montana, Oregon, Washington	September 1982
7	Pacific Southwest Regional Medical Library Service (PSRMLS) Biomedical Library University of California, Los Angeles	Arizona, California, Hawaii, Nevada, and U.S. territories in the Pacific basin	September 1982

TABLE 9

DEMOGRAPHICS OF THE RECONFIGURED REGIONS
1980 DATA



South Dakota, formerly part of the Midcontinental region, requested and received reassignment to the newly configured Region 3—Greater Midwest Regional Medical Library Network (GMRMLN). In each case the existing RML headquarters library submitted a successful RML contract proposal without competition from other libraries.

Significant change and considerable competition occurred in the three newly configured eastern and midwestern regions. The old Regions I, II, III, and Puerto Rico, formerly part of Region IV, were combined into Region 1, the Greater Northeastern Regional Medical Library Program (GNRMLP). Three proposals to provide RML services for Region 1 were submitted by the New York Academy of Medicine, New York; the College of Physicians, Philadelphia; and the University of Connecticut, Health Sciences Library, Farmington, which submitted a joint proposal with the Countway Library, Harvard University, Boston. The New York Academy of Medicine was selected as the RML, effective December 1, 1982.

Old Regions IV and VI were combined to form the Southeastern/Atlantic Regional Medical Library Service (SEARML). NLM had decided to concentrate on network administration and management, and withdrew from its role as an RML. One proposal, which included a subcontract to provide MEDLINE training with the University of North Carolina, Chapel Hill, Health Sciences Library, was received from the University of Maryland Health Sciences Library, Baltimore. The University of Maryland Health Sciences Library was awarded the contract for RML services in Region 2. The online training subcontract was not awarded, and NLM continued to provide online training for this area. The Region 2 contract did, however, include a subcontract with the University of Alabama, Lister Hill Library of the Health Sciences, to provide extension services for the southern states.

In the Midwest, old Regions V and VII and South Dakota were combined to form the Greater Midwest Regional Medical Library Network (GMRMLN), Region 3. The University of Illinois at Chicago, Library of the Health Sciences was the sole bidder for this contract which was awarded in January 1983.

Organization and Management of the RML Program

Management of the Program at NLM

After Sheldon Kotzin accepted another position at NLM, Duane Arenales served as the acting RML coordinator from 1982–1983; Becky Lyon-Hartmann was appointed to this position in 1984. The RML coordinator continued to report to the associate director for Library Operations; Lois Ann Colaianni replaced Joseph Leiter, Ph.D., in this position first on an acting basis in 1982, and permanently in 1984. Martin M. Cummings, M.D., director of NLM since the inception of the RML program, retired early in 1984; Harold Schoolman, M.D., served as acting director until Donald A.B. Lindberg, M.D. was appointed in October 1984. An RML Policy Group was established at NLM, composed of the deputy director for NLM and the associate directors for Extramural Programs and for Library Operations. The Policy Group served as the oversight body, coordinating major policy discussions and changes in the RML program.

The MLAA funding levels remained static throughout this entire period, as almost all federal government agencies and programs operated under a continuing resolution. The amount of funding obligated to the RMLP decreased from $2,399,000 in 1982 to $2,000,000 in 1985. Despite the saving generated by decreasing the number of regional libraries from eleven to seven, and the institution of cost-recovery measures for certain RML programs and services, it still became necessary to make additional cuts by the third year of the contracts. These budgetary limitations, coupled with concern over whether the MLAA would receive renewed authorization, made it difficult to respond to new regional needs and to recruit staff. The requirement to make budget cuts quickly also precluded appropriate preparation and consultation with network participants concerning the instituted changes. Steadily increasing indirect cost rates, charged to the RML contract by the host institution, reduced the amount of contract funds available for RML services. RML directors attempted to arrange reduced indirect cost rates, but had limited success since the rates were generally negotiated by their parent institution with the Department of Health and Human Services to cover a wide range of federally funded projects.

RML Directors' Meetings

Reconfiguration and the attendant pressures caused by the competitive contract bidding process caused occasional communications breakdowns and strained relations between NLM and the RML directors. At the May 1983 RML Directors' Meeting only the RML directors were permitted to attend. The directors objected to this practice, as they had in 1971, since the associate directors were responsible for the daily operation of regional programs and could not function effectively if they were excluded from policy and program discussions at this important forum. After considerable debate and negotiation, the associate directors were included in subsequent meetings. Another change took place when NLM began treating RML Directors' Meeting as a meeting of contractors, thus excluding outside observers.

At the RML Directors' Meeting in 1983 and 1984, several discussions ensued concerning the future of the RML program. Topics included the implications of the existence of, or lack of, an RML network, and identification of core RML program elements. These discussions provided background information for a working group of NLM staff charged with re-examining the existing RML program. The NLM Working Group recommended that the RML program should continue as presently configured. It further recommended that Requests for Proposal (RFPs) for five-year, incrementally funded contracts be issued as existing contracts expired [217].

Three basic goals for the program were defined [218:24]:

1. To improve access to and delivery of information to health professionals.
2. To develop and maintain an effective and efficient network of health science libraries.
3. To develop and maintain linkages between the network and other library/information networks or health professional organizations to share resources.

The passage of the Health Services Extension Act in 1985, extending the MLAA through September 1988 at increased authorization levels, made implementation of the programs proposed in the new contracts possible. NLM issued an RFP for the RML contracts in February 1985. By early 1986 awards had been made to the existing RMLs, which were the sole bidders in each of the seven regions [219].

Programs and Services

The contracts issued in 1982 and 1983 gave priority to the provision of information services to health professionals regardless of geographic location. Each RML identified underserved areas in its

region, and developed plans to improve access to information in these areas. Basic RML services remained essentially unchanged, although the cost of providing several of the services was now shared with the recipients. Evaluation to determine achievement of network goals, demonstrate the benefits of network services, and examine new or emerging information needs continued to be an important activity.

The RML RFP also included provisions for the award of three "options," or supplementary activities, in addition to the basic contract. They were: (1) the provision of initial and advanced online MEDLINE training, (2) the creation of instructional packages primarily for BHSL personnel, and (3) the development of model projects in information transfer. Despite the submission of proposals for all three options, the only option awarded was for online training; PSRMLS and MCRMLP continued to provide these services.

Interlibrary Loan

All the new contracts required RMLs to provide interlibrary loan services, specifying that the charge per filled request not exceed the then national maximum of $6.00. The intent was to complete the phasing out of contract funding for the delivery of documents, restricting their use to support management of the system. Table 10 illustrates the regional interlibrary loan traffic handled by the RLs during this period.

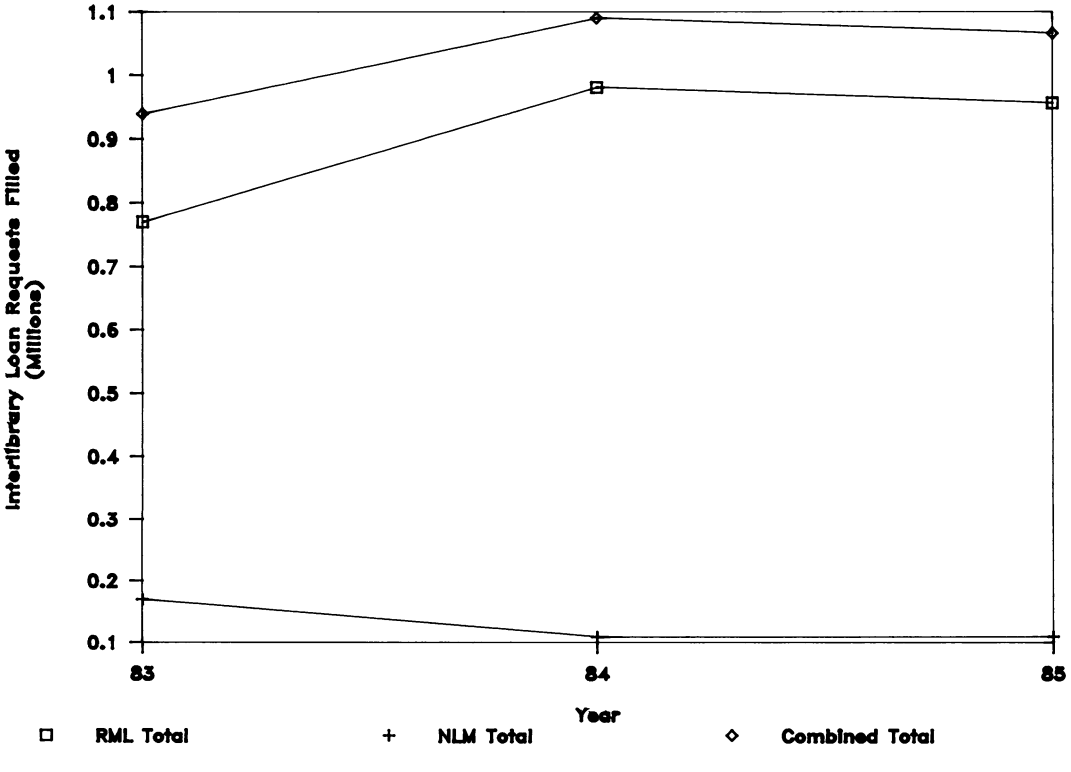
Significant changes were also instituted in the hierarchical referral network which had been in place since the inception of the RML network. Effective October 1983, NLM began to accept requests directly from any library for periodical articles unavailable within a region, [220] and established, for the first time, a charge of $5.00 for all interlibrary loan requests filled for domestic libraries [221].

Interlibrary loan network management responsibilities included the implementation of DOCLINE as it became operational in the regions. Throughout 1984 DOCLINE was tested by the RMLs, and on March 15, 1985, the UCLA Biomedical Library, which had served as a test site for DOCLINE development since 1976, transmitted the first official DOCLINE request to NLM [222]. In order to

TABLE 10

INTERLIBRARY LOAN STATISTICS

1983–1985



evaluate carefully the impact of DOCLINE on the overall performance of the NLM online system, other libraries were added gradually. The RMLs came first, followed in May 1985 by the RLs in Region 1, and in July by libraries in the Medical Library Center of New York consortium. Region 7 libraries in the states of Arizona, Hawaii, and Nevada began to use the system in September 1985; California libraries were added in January 1986. All RLs in the country, except those in Region 4 which utilized Octanet, had been added by December 1985, and plans were in place to add all remaining BHSLs by the end of 1986 [223].

Union Lists and Catalogs

Union list efforts concentrated primarily on the submission of serials holdings data from as many network libraries as possible to SERHOLD (*Serials Holdings*), formerly known as the National Biomedical Serials Holdings Database. The primary objective of SERHOLD was to support the automated routing of interlibrary loan requests on DOCLINE. When a request was entered into DOCLINE, the computer would check SERHOLD and automatically route the request to a library which owned the serial title. SERHOLD data could also be manipulated to produce regional union lists in print or microform format. Each RML appointed a SERHOLD holdings data coordinator who assumed responsibility for collecting regional serials holding data for submission to SERHOLD, disseminating policy information, and reproducing and distributing products within the region [224].

During this same period, NLM investigated the feasibility of developing an online holdings database for monographs and audiovisuals, but concluded that the small number of such loans processed by network libraries, generally less than 20% of the total traffic, did not justify the cost of developing such a database. NLM and the RMLs would instead concentrate on developing linkages to existing databases such as OCLC. BHSLs were identified as the libraries most in need of access to monograph and audiovisual location information, and the RMLs were very interested in providing access to such information [225]. GMRMLN continued to provide such access via its online union catalog [114].

MEDLINE

The NLM online network continued to grow significantly, as did the number of trained searchers. The online training centers at NLM, UCLA, and the University of Nebraska expanded the number of off-site initial and advanced training classes offered, with technical resource persons (TRPs) continuing to provide annual updates at various locations.

In response to complaints from users about inconsistent charges for MEDLINE searches, NLM proposed a national maximum $25.00 fee for a basic MEDLINE search provided by RMLs or RLs. In presenting the policy at the May 1983 RML Directors' Meeting, NLM defined a basic or "minimum" search as [218:9]:

1. Search of a single non-royalty database.
2. Formulation, retrieval, and evaluation requiring not more than thirty minutes.
3. Searching consuming approximately fifteen minutes or less of online connect time, including searching and printing online retrieval.
4. In most cases, retrieval will include author, title, and source data elements; or author, title, publisher and year of publication.
5. The search may include requesting an offline print, but the cost of the offline print itself is not included.

With a national maximum charge in place, NLM was willing to make referrals for online searches to institutions which agreed to the stated guidelines.

Technological advances precipitated two significant changes in the use of NLM online databases during this period. The increasing availability of microcomputers created greater interest among health professionals in conducting their own online searches. NLM responded by developing a one-day course and workbook, *The Basics of Searching MEDLINE: Guide for the Health Professional,* [226] to train health professionals how to search MEDLINE. This course was quickly followed by a course for librarians entitled "Teaching MEDLINE to the Health Professional: A Workshop for Search Intermediaries." By training trainers, the number of individuals who could provide the "Basics of Searching MEDLINE" course throughout the country increased substantially. The RMLs took an active role in encouraging librarians throughout the region to take the "Teaching MEDLINE" course and to provide instruction to health professionals [227]. Such encouragement to teach was welcomed by most libraries, which rapidly developed active training programs for health professionals.

Institutions and individuals also became interested in mounting portions of the various NLM databases on in-house computers, to allow for local

searching without incurring online connect charges. In response to this interest, NLM developed a *Domestic MEDLARS Subset Policy* [228] designed to make it possible to lease subsets of the MEDLARS database on tape, and to mount these subsets of MEDLARS on personal or institutional computers.

Reference Services

The provision of backup reference services continued in most regions. In 1983 NLM and the RMLs in Regions 3, 6, and 7 participated in a test project to determine the feasibility and need for a cooperative reference network consisting of the RMLs and NLM. The participants used electronic mail to broadcast difficult reference questions which had not been answered locally. Only a few questions were submitted during the project period and the results were inconclusive. However, RMLs were encouraged to submit difficult questions to NLM, which would try to locate answers or make an appropriate referral [224].

Resource Sharing

One new element of the RML contracts was the provision of funding for cooperative acquisitions of most types of library materials. Region 1 developed a Cooperative Acquisitions Program (CAP) which identified, through examination of interlibrary loan requests, subject area and serial title gaps. Resource libraries were funded to purchase these needed materials, thus making them available to Region 1 libraries via interlibrary loan. Region 1 also developed a serials acquisitions and retention program called Regional Coordination of Biomedical Information Resources (RECBIR). RECBIR was coordinated and operated by the Medical Library Center of New York; the RLs and some of the larger libraries in Region 1 agreed to maintain subscriptions to journals indexed in *Index Medicus* and other health indexes and abstracts [229].

In Region 3, the funds were allocated to RLs and BHSLs in each of the ten states in the region, with emphasis placed on purchasing materials for subject areas not widely held in the region [230]. TALON applied its funding to its cooperative acquisitions program for monographs, established in 1979 [215].

Consulting and Training Services

The consulting and training services, designed to prepare hospital library managers to provide information services and make use of network services, were continued in the new contracts, albeit on a cost-recovery basis. In the first year, RMLs were required to recover 25% of the cost of providing consultations and presenting workshops. By the third year, participants were to pay 75% of the costs. This cost recovery approach was "...expected to lead to self-sustaining basic training and consultation programs" [216:3].

NLM compiled and distributed a list of all RML training manuals to promote sharing of this information among RMLs and other interested trainers. At the February 1984 RML Directors' Meeting, NLM announced that the need to continue federal funding of consulting and training programs would be considered in the overall RML program evaluation in preparation for the next round of RML contract bids [231]. By the end of that year, it became clear that these consulting and training services would most likely be phased out as an RML service in future contracts. Several RMLs began to develop rosters of individuals willing to serve as consultants in their regions, in order to provide referrals when such services were requested. PSRMLS also developed a workshop entitled "Consulting Services and Library Skills Training: A Seminar for Librarians," designed to interest local librarians in serving as consultants and trainers, and to acquaint them with available resources for the provision of these services.

Grants

The role of the RMLs in the NLM grant review process changed substantially in 1983. Providing comments on grants, as requested initially by the BLRC in 1972, was "...regarded by some as prejudicial to the NIH peer review process" [218:4]. RMLs, therefore, no longer provided such comments, but continued, upon request, to work closely with applicants during the proposal preparation phase [232].

Audiovisual Services

The RMLs continued to coordinate the provision of audiovisual loans from the NMAC videocassette satellite collections in each region. The role of regional audiovisual consultants, as a formal part of the RML program, was eliminated in the new contracts. However, names of individuals willing to serve as audiovisual consultants were usually part of regional consultant rosters. Some RMLs continued to provide training courses on the acquisi-

tion and management of audiovisuals in a health sciences library.

Regional Planning and Evaluation

Each RML was charged with selecting some aspect of its programs and services to evaluate during the contract period. Projects undertaken included: (1) evaluation of an online catalog of monographs and audiovisuals (Region 3); (2) the effect of Octanet on interlibrary loan turnaround time (Region 4); (3) the development of baseline data on consultation programs and locator tools (Region 2); (4) the effect of a cooperative acquisitions program (Regions 1 and 5); (5) the extent of non-contract RML program support (Regions 4 and 6); (6) the effect of locator tools on interlibrary loan patterns (Region 7); (7) the impact of RML programs on underserved areas (Regions 3 and 6); and (8) the impact of the RML program on the development of hospital libraries (Region 7) [217].

The evaluation of the TALON Cooperative Acquisitions Program demonstrated that an increased availability in that region of monographs issued by the publishers whose publications the RLs had agreed to obtain. This study also provided valuable information on the objectives of the program which were not being met, thereby instigating an overall reassessment of policies and procedures [125]. Region 1 gathered baseline data to assist in a future evaluation of the effect of its Cooperative Acquisitions Program on regional interlibrary loan fill rates and to identify additional journal titles or subject areas which needed to be strengthened.

The survey of network library contributions to the RML program in Region 4 indicated that 22.8% of its RML program expenditures were contributed by the RLs, primarily in staff efforts [227]. In Region 7 a preliminary analysis of the effect of union lists on interlibrary loan borrowing patterns revealed that interlibrary loan traffic among BHSLs in a sub-regional area increased after publication of the first union list for that area. It was not possible to show a definite cause and effect relationship, but PSRMLS felt that the publication of the union list did contribute to this change [217]. Region 2, which published its first regional union list in October 1983 gathered baseline interlibrary loan data to determine if there was any relationship between the availability of the union list and interlibrary loan traffic patterns and fill rates. A complete analysis was scheduled when sufficient data become available [233].

Regions 5, 6, and 7 all conducted surveys of BHSLs in their regions to gather baseline data on library collections, organizations, services, and staffing. In Regions 5 and 6 these data were tabulated [234–236] and plans were made to conduct future studies once longitudinal data were collected and analyzed.

Because baseline data from surveys conducted both in 1969 and 1971 were available, Region 7 was able to conduct an evaluation of the development of hospital libraries in its region, and to assess the quality of PSRMLS programs and their effects on the libraries surveyed. The study revealed that hospital libraries in Region 7 had improved significantly on a number of criteria between 1969 and 1984. In 1969 only 40% of the hospital libraries were staffed by library managers or librarians, as compared to 69% in 1984. The number of hospital librarians with M.L.S. degrees increased from 35 in 1969 to 249.5 in 1984. Collection size also improved significantly. In 1969 70% of hospital libraries subscribed to fifty or fewer journal titles; in 1984 only 40% of the libraries subscribed to fifty or fewer journal titles. The range and amount of services provided also increased. For example in 1969, 30% of BHSLs provided manual or computerized bibliographies, as compared to 100% in 1984. Interlibrary lending and borrowing activities increased substantially, and organization and currency of the collections also improved, with more libraries regularly weeding and cataloging their collections. Data analysis also confirmed that PSRMLS had a major impact on library operations and services in the region. Respondents gave highly positive ratings to the quality of PSRMLS programs, and the direct impact of these programs on library operations was demonstrated [237,238].

Relations with Other Networks and Programs

Increased emphasis was placed on exploring possible avenues of cooperation with other library networks. Particularly pertinent was the emerging national interest in intertype library networks which promoted cooperation and resource sharing between all types of libraries such as public, academic, and special, including health sciences, libraries.

Technological Developments

In the interim between DOCLINE experimentation and implementation, basic health sciences libraries, with the encouragement of the RMLs, began to use electronic mail to speed the transmission of interlibrary loan requests [239]. NLM conducted an electronic mail pilot test with

Regions 6 and 7, and developed, with RML input, a recommended format for the transmission of interlibrary loan requests via electronic mail [227]. Region 4 continued to use Octanet for the electronic transmission of interlibrary loan requests within the region and to NLM.

Region 6 experimented with a remote search system designed to allow two geographically separate users of an online search system to see simultaneously the results of an online search being conducted by one of the users. This search capability allowed a health professional located in an area without a trained online searcher to interact with a searcher at another location while a search was being conducted [240].

Region 3 conducted a pilot serials exchange study, designed to create a machine-readable database of duplicate serials available for exchange between libraries. A microcomputer program was developed, which combined into one alphabetical sequence the lists of duplicate journal issues submitted via electronic mail by participating libraries [240].

Publicity and Publications

In an effort to reach health professionals directly, increased emphasis was placed on exhibiting at health professional meetings. Several RMLs designed special exhibits advertising the availability of information services. The health professional online training course, "The Basics of Searching Medline," was taught by NLM and RML online trainers at several national meetings. Publications emphasizing the accomplishments of the network were also prepared [241].

Impact of the Regional Medical Library Program

In the twenty years since the passage of the MLAA, the RMLP has significantly improved the means by which health professionals and health sciences librarians obtain and manage information. The network, as developed in the late 1960s, has stood the test of time, undergoing constant modification in response to fiscal and environmental changes, yet never losing sight of its ultimate goal—rapid and effective delivery of health information to health professionals.

Delivery of Documents to Health Professionals

The interlibrary loan network organized and managed by the RMLP, greatly improved delivery of documents to health professionals. As illustrated in Table 11, the NLM, the RMLs, and the RLs delivered over ten million documents to health professionals between 1969 and 1983. Statistics on the BHSL document delivery traffic are not available, but it is estimated that over 50% of the interlibrary loan traffic in each region is handled by these libraries. If this assumption is valid, then the total number of documents delivered by all types of health sciences libraries during this period is in excess of twenty million. Table 12 provides a comparison of the BHSL and RML/RL interlibrary loan requests filled in Region 7.

In the years just prior to the passage of the MLAA, NLM was processing a significant number of interlibrary loan requests for the nation's libraries. An analysis of the interlibrary loan requests processed in 1959 [243] tabulated the number of loans to individual libraries, and recorded the most frequently requested journal titles. The top five journals requested at that time were [243:3]:

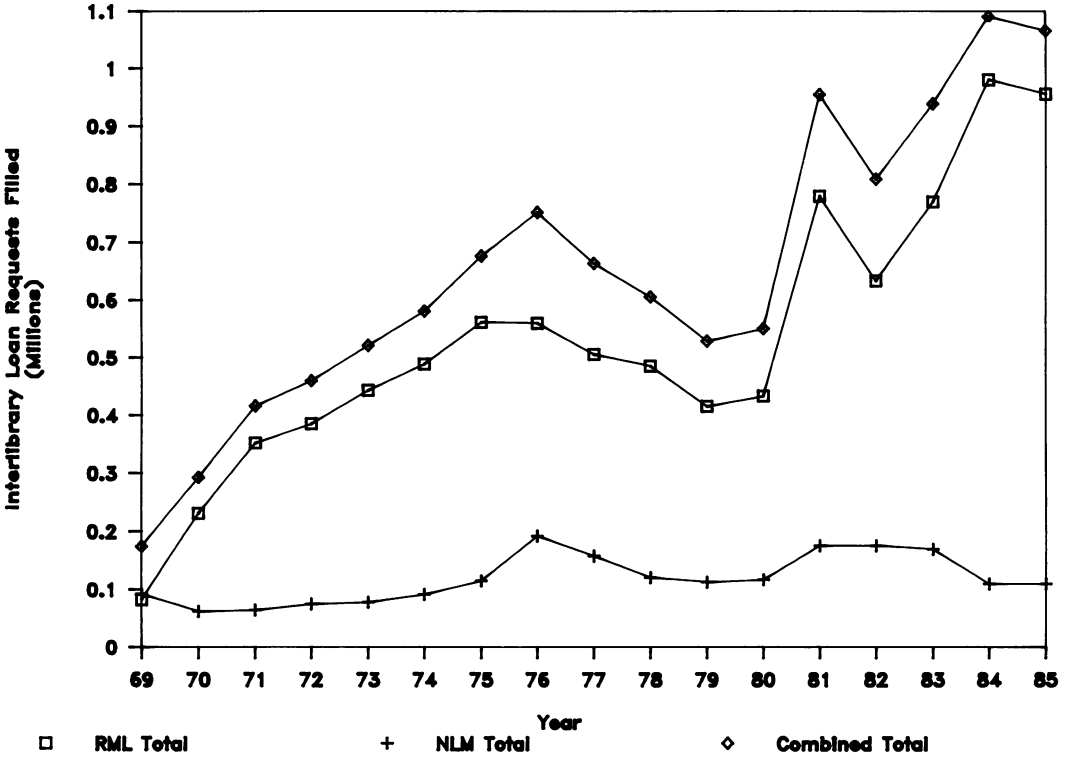
1. *Lancet*
2. *British Medical Journal*
3. *American Journal of Physiology*
4. *Journal of the American Medical Association*
5. *Journal of Biological Chemistry*

A recent analysis of NLM's 1984 interlibrary loan requests [244] revealed that regional reliance on NLM for interlibrary loan purposes had decreased significantly. For example, in 1959, 55% of the libraries submitting requests to NLM received ten or fewer loans; in 1984 71% were in this occasional use category. In 1959 16% of the libraries received only one photocopied article, by 1984 26% were in that category [244:9]. In 1984 the most heavily requested titles were quite different from those requested in 1959 [244:12]:

1. *Clinical and Experimental Obstetrics and Gynecology*
2. *Italian Journal of Neurological Sciences*
3. *European Journal of Gynaecological Oncology*
4. *Medicina Clinica*
5. *Nursing*

The comparison of the journal titles most frequently requested in 1959 and 1984 suggests that regional resources are now sufficient to meet the need for widely used journal titles, and NLM is needed only as a backup for unusual, mainly foreign titles. Through the creation of union lists the RMLP has clearly identified what is available locally, cooperative acquisitions programs among both RLs and BHSLs have identified titles which should be available locally based on frequency of

TABLE 11
INTERLIBRARY LOAN STATISTICS
1969–1985



use, and network protocols have insured the utilization of these local resources.

One measure of the value of the documents delivered to health professionals by the RML network is the willingness of the consumer to absorb the costs of obtaining these documents once federal funding was withdrawn. Tables 13 and 14 clearly illustrate that more loans processed by RMLs and RLs were funded by the user than by RML contract funds.

Delivery of Information to Health Professionals

As stated in the 1964–65 President's Commission report:

> To achieve "fingertip" control of the literature of all that is known about the causes, pathology, and treatment of heart disease, cancer, and stroke, and to make this knowledge available to researchers, educators, and practitioners, is an objective to which anyone may wholeheartedly subscribe [2:381, vol. 2].

The development of the MEDLARS system, including the provision of online access to its databases, proved to be the means by which health professionals could have "fingertip" access to the published literature. The RML program was instrumental in the creation of a network of online search centers, including both libraries and individual health professionals, which greatly facilitated and increased access to this wealth of health sciences information. The change over the past twenty years is remarkable. In 1964 there were only three locations from which health professionals could request computerized literature searches; in 1985 over 4,000 libraries and individuals could access the system directly. In 1965 it took an average of four weeks to generate a list of references; in 1985 it took only minutes. A 1982 study indicated that MEDLINE searches were requested predominantly for patient care (34%) and research (34%), with educational purposes coming third (18%). The majority of searches (87%) were conducted in hospital and academic health sciences libraries [245].

Such instantaneous and convenient access to the literature has saved lives. To provide just two examples, at Sinai Hospital in Detroit a child with a rare blood disorder could possibly not tolerate the normal antidote for a snake bite she had suffered.

TABLE 12

REGION 7 INTERLIBRARY LOAN REQUESTS
Processed by Resource Libraries and
Basic Health Sciences Libraries

MEDLINE provided citations to two articles which indicated an alternative, life-saving treatment [246]. An internist in Atlanta turned to MEDLINE for assistance in the diagnosis of a difficult case. The reference retrieved caused him to order further diagnostic studies, which revealed a Burkitt's lymphoma and permitted early, aggressive treatment [247].

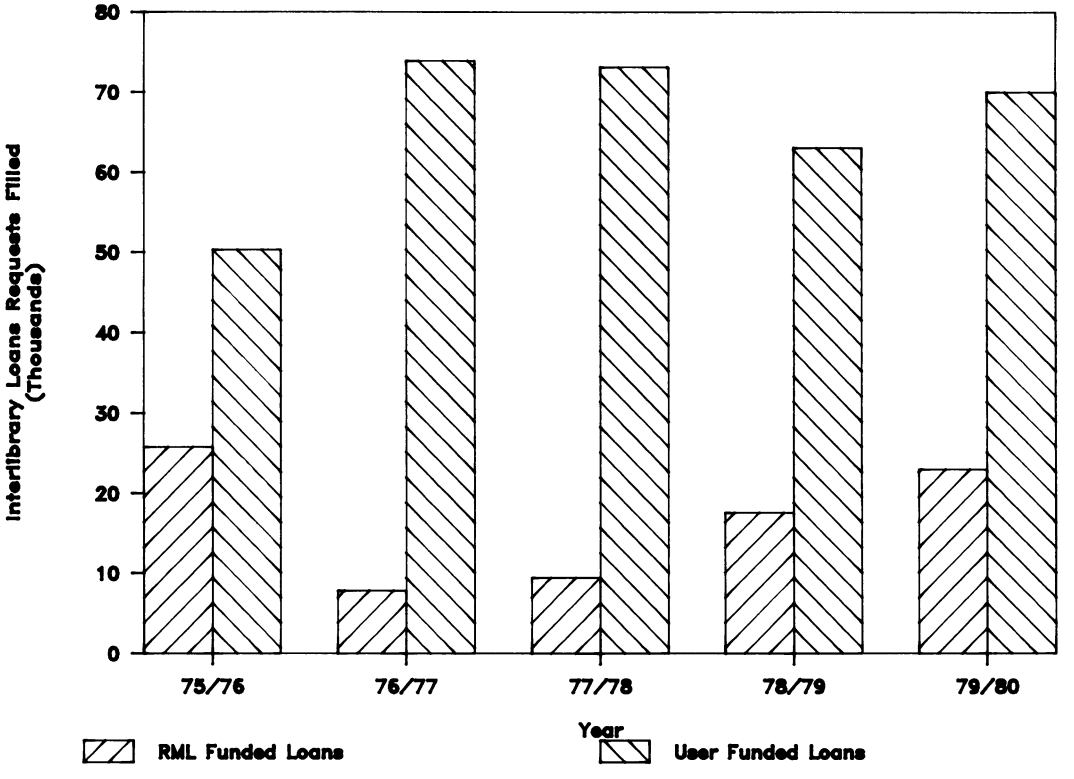
Creation of a Viable, Effective National Library Network

To cite the President's Commission report again, "Communication of information to scientists and practitioners is critically important to progress in research and application of medical knowledge. Medical libraries are the primary vehicle for accomplishing this communications process" [5:65, vol. 1]. The RMLP played a key role in the creation of a viable, effective national health sciences library network, and provided assistance to many health science libraries, enabling them to develop to a stage where they could participate in network activities.

From the outset, the RMLs recognized that in order to accomplish network objectives successfully, each region needed a cadre of well-developed health sciences libraries. Without local access to well-organized library resources, there could be intolerable delays in the delivery of information. A study of hospital library development in one region of the RML network documented extensive growth among hospital libraries between 1969 and 1984 in the areas of staffing, collection size, and services. The programs of the RML in this region were credited with stimulating specific improvements in library resources and services [237,238]. As hospital libraries across the nation developed, they organized sub-regional networks, or consortia, to promote cooperation and resource sharing on a local level. Over 267 consortia were in existence by 1985. As Topper stated:

> One of the great successes of the RMLP...has been to encourage the professional growth of hospital librarians....By providing a mechanism for librarians to tap the vast resources of the medical literature...the RMLP has helped hospital libraries to demonstrate their effective-

TABLE 13
REGION V INTERLIBRARY LOANS
1975–1980



ness and broaden their user population. As...funding has decreased, librarians have been encouraged to rely on one another and develop new avenues to satisfy the needs of their enlarged clientele [248:61].

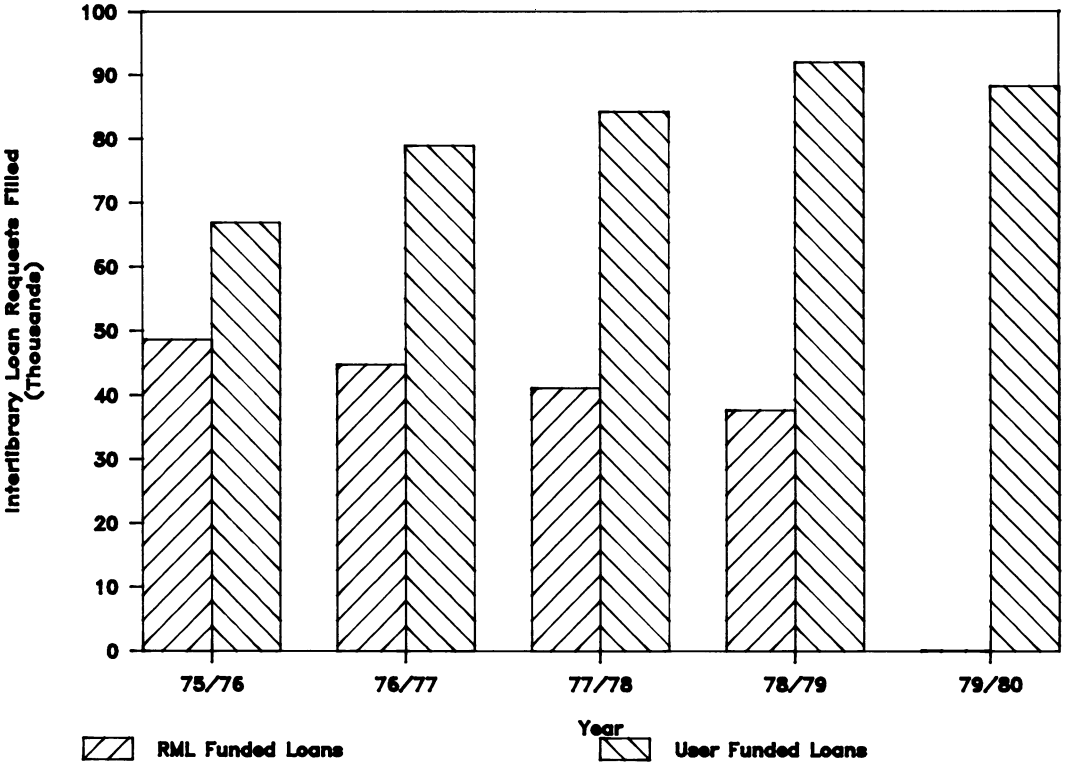
Health sciences libraries cooperated prior to the development of the RML network, but such cooperation frequently was limited to circumscribed geographic areas, or among libraries of similar types. The RML network has successfully coordinated the activities of over 3,000 libraries, located in 50 states and several U.S. territories, towards the accomplishment of a common goal. The network development has been evolutionary in nature, responding to fiscal and environmental influences and the changing information needs of health professionals. The national policies promulgated by the program provide a reasonable degree of uniformity in the delivery of health care information, without jeopardizing necessary regional variations. The RML network is a model which:

...allows for a distribution of service consistent with the level of need and the characteristics of the individual regions. It allows for innovative solutions that vary with the level, extent, and priority of the problem. It provides for testing different marketing models for RML network products and services so that if one fails the entire network does not fail and if one succeeds it can be transferred. And this transfer characteristic or diffusion of innovation throughout the network is the stimulus for the biological evolution of network programs and services. And yet the innovation does not override national network uniformity. The common mission, guiding principles, program areas, and goals remain constant. Only the objectives vary and are open to this creative process [242:121–2].

And, as noted by Cheshier, the RML network has coordinated its programs and services with other networks:

Make no mistake, our medical library network has become a much envied model. As the program has expanded and improved, medical libraries have become more involved with other types of libraries and with all types of technology. OCLC, for example, by creating access and hence a variety of linkages among 2,500 libraries, has lessened the perceived differences among types of libraries at the same time it has broadened medical libraries' participation. I believe that this trend will continue and that we will increasingly concentrate

TABLE 14
REGION XI INTERLIBRARY LOANS
1975–1980



upon using such systems to serve our users without necessarily relying primarily on libraries like ours [249:377].

Use of Technology to Improve or Enhance the Delivery of Information

A key factor in the delivery of information to health professionals is the time elapsed between a request for information and receipt of the document. In patient care situations, a few hours can make a significant difference. Starting with the use of teletypewriters to transfer requests for information, the RML network has promoted the use of new technologies as they become available to insure rapid information delivery. The development and implementation of DOCLINE, which virtually eliminates the time-consuming process of locating a source for the needed information will significantly decrease the time it takes to place a needed document in the user's hand. Health sciences libraries are actively experimenting with technologies such as telefacsimile to speed the delivery of the documents even more.

Health sciences libraries have been leaders in the application of technology to the management of information. NLM's MEDLARS system was one of the first, and most successful examples of the use of computers to organize and provide access to the ever-growing scientific periodical literature. To pinpoint locations of source documents, RML network participants have made extensive use of computers to create union lists of serials, monographs, and audiovisuals. Once these lists were completed the network libraries compared regional holdings to interlibrary loan traffic and utilized this information to set priorities for cooperative collection development projects.

The familiarity with computers and computer applications gained when searching online databases, or creating union lists, helped to prepare many health sciences librarians for today's microcomputer environment, and for the automation of many library operations, thus facilitating the provision of better and more efficient service. Health professionals also benefited from the increased availability of audiovisual educational programs made available through NLM, the RML network, and local libraries. In many instances, librarians

introduced the use of audiovisuals for educational purposes in their own institutions.

Future of the Regional Medical Library Program

The new five-year RML contracts for the period 1986–1990 indicate some of the future activities of the RMLP. RMLs will continue to coordinate network activities in areas such as interlibrary loan, development and maintenance of union lists, and cooperative acquisitions and resource sharing programs. Consulting and training programs for hospital library managers provided by RML staff will be phased out completely in all regions by 1988, although the RMLs will continue to coordinate educational and training programs to some extent. Individuals or institutions needing training or consulting services will be referred by the RMLs to regional consultants. Online training and services are now the responsibility of three RMLs: the New York Academy of Medicine serves the Eastern Online region, comprising Regions 1 and 2; the University of Nebraska is responsible for the Midlands Online region, containing Regions 3, 4, and 5; and the UCLA Biomedical Library provides services to Regions 6 and 7, which make up the Western Online Region.

Two new programs, a national reference referral network and a national preservation plan for health sciences libraries, are scheduled to be developed and implemented during the contract period. The RMLs also had an opportunity to submit proposals for special RML program enhancements, designed to improve or expand network services, or to provide essential data for the design of improved information services programs [219]. Three initial enhancements were funded: Region 1 will be experimenting with the addition of non-NLM titles to the SERHOLD database; Region 6 will develop a microcomputer-based local information directory; and Region 7 will conduct an evaluation project to assess the actual use by health professionals of documents delivered through the RML interlibrary loan network [250].

It is clear that technological developments have and will continue to influence the means by which individuals access information. To date, the RMLP has capitalized on such developments, thus creating a responsive network capable of providing access to and delivering information rapidly and effectively. Much, however, still needs to be done.

Although it is now possible to retrieve quickly citations for articles on a particular topic, and to transmit requests for copies of these articles rapidly, the delivery of the actual document can still be delayed by several days. It is now important to concentrate on development of improved mechanisms for the delivery of information, including telefacsimile, optical disk technology, and online access to the complete text of documents. It is also critical to provide more detailed information on the contents of lengthy information sources such as books so that requesters can ask for the transmission of needed portions only.

The RMLs can play an important role in the introduction of technological developments in health sciences libraries which, as Palmer states, "...must be converted into information-management centers.... This requires not only expanding use of technology such as development of expert systems and methods to aid in processing information, but also providing health sciences librarians with the baseline knowledge to manage the automated library and data files" [251:46]. The RMLs can also serve as testing grounds for newer information technologies, and promote their adoption among health sciences libraries.

Despite the best efforts of the RMLP, there are still areas of the country where health professionals do not have ready and convenient access to information. Even in areas with excellent information resources, there is increased interest in the ability to access information from office, laboratory, or home settings. Scientific research is becoming increasingly interdisciplinary; information must therefore be obtained from a variety of sources. The development of an electronic medical information network, which would allow any health professional or librarian to obtain specific information, conduct a literature search, or obtain a document directly through a personal microcomputer, would address these needs. The medical information network should be electronically linked to all types of libraries, databases, health agencies, or any other pertinent source of information. The organization and development of such a network presents a considerable challenge to the RMLs and NLM since it would require the development of complex electronic communications protocol, "user friendly" search systems, and the establishment of links with many libraries, publishers, database vendors, institutions, and agencies.

Research into the nature and use of health information, its value to the health care delivery system, and its relation to the improvement of health must receive high priority, so that information delivery mechanisms can effectively address user needs. The RMLs, in collaboration with insti-

tutions and libraries in their regions, can be active participants in the conduct of such research. Databases of pertinent health sciences library management information should be created and maintained, and trends and developments analyzed and reported in the literature.

None of these proposed projects can be accomplished without a coordinated national effort and effective leadership. The NLM and the RMLs working in concert have created a model national information access and delivery network. They are well qualified and possess the skills to transform the RML network in the future environment, so as to continue to fulfill the national need for health information so eloquently described by President John F. Kennedy:

> The accumulation of knowledge is of little avail if it is not brought within reach of those who can use it. Faster and more complete communication from scientist to scientist is needed, so that their research efforts reinforce and complement each other; from researcher to practicing physician, so that new knowledge can save lives as swiftly as possible; and from the health professions to the public, so that people may act to protect their own health [252].

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GLOSSARY OF ACRONYMS AND INITIALISMS

AACR2	*Anglo American Cataloguing Rules*, 2nd edition
AAMC	Association of American Medical Colleges
AHEC	Area Health Education Center
AIM-TWX	*Abridged Index Medicus* on Teletypewriter Exchange
AMA	American Medical Association
ASCLA	Association of Specialized and Cooperative Library Agencies
AVLINE	Audiovisuals Online
BCN	Biomedical Communications Network
BHSL	Basic health sciences libraries
BISI	Biomedical Information Services Institute
BLRC	Biomedical Library Review Committee
BRS	Bibliographic Retrieval Services
CAI	Computer assisted instruction
CAP	Cooperative Acquisitions Program
CATLINE	Cataloging Online
CMLS	Central Medical Library Service
COSAP	Cooperative Serials Acquisitions Program
DOCLINE	Documents Online
EMP	Extramural Programs (NLM)
GMRMLN	Greater Midwest Regional Medical Library Network
GNRMLP	Greater Northeastern Regional Medical Library Program
ILLINET	Illinois Library and Information Network
JCAH	Joint Commission on Accreditation of Hospitals
KOMRML	Kentucky-Ohio-Michigan Regional Medical Library
LO	Library Operations (NLM)
LTI	Library Training Institute
MARML	Mid-Atlantic Regional Medical Library
MCRMLP	Midcontinental Regional Medical Library Program
MEDLARS	Medical Literature Analysis and Retrieval System
MEDLINE	MEDLARS Online
MERMLS	Mid-Eastern Regional Medical Library Service
MHSLN	Midwest Health Sciences Library Network
MICIS	Michigan Interinstitutional Committee for Information Science
MLA	Medical Library Association
MLAA	Medical Library Assistance Act
MLCNY	Medical Library Center of New York
MLGSC	Medical Library Group of Southern California
MRML	Midwest Regional Medical Library
NBHDB	National Biomedical Holdings Data Base
NBSHDB	National Biomedical Serials Holdings Data Base
NEMIS	Network Management Information System
NERMLS	New England Regional Medical Library Service
NLM	National Library of Medicine
NMAC	National Medical Audiovisuals Center
NY/NJ RML	New York/New Jersey Regional Medical Library
NYAM	New York Academy of Medicine
NYSILL	New York State Interlibrary Loan Program
OCLC	Online Computer Library Center
Octanet	Automated interlibrary loan network
PHILSOM	Periodical Holdings in Libraries of Schools of Medicine
PMI	Postgraduate Medical Institute
PNRHSL	Pacific Northwest Regional Health Sciences Library
PNRHSLS	Pacific Northwest Regional Health Sciences Library Services
PPM	Program Planning Model
PSRMLS	Pacific Southwest Regional Medical Library Service
RECBIR	Regional Coordination of Biomedical Information Resources
RFP	Request for Proposal
RL	Resource Library
RML	Regional Medical Library
RMLP	Regional Medical Library Program
RMP	Regional Medical Programs
SEARML	Southeast Atlantic Regional Medical Library
SERHOLD	Serials Holdings Database

SERLINE	Serials Online	TRP	Technical Resource Persons
SERMLP	Southeastern Regional Medical Library Program	UCLA	University of California, Los Angeles
SCORE	Standing Committee for On-Line Retrieval Education	UCMP	Union Catalog of Medical Periodicals
TALON	Texas, Arkansas, Louisiana, Oklahoma, New Mexico	WILS	Wisconsin Interlibrary Loan Network

APPENDIX 1: DIRECTORS AND ASSOCIATE DIRECTORS OF REGIONAL MEDICAL LIBRARIES

The terminology used for the administrative heads of each RML varied among regions. For the sake of consistency in this listing, the term director is used for the director of the library responsible for providing RML services; the term associate director is used for the individual(s) responsible for the day-to-day operations of the RML.

ORIGINAL ELEVEN REGIONS

Region I: New England Regional Medical Library Service

Director: Ralph T. Esterquest, 1967–1968
Harold Bloomquist, 1968–1975
Foster M. Palmer (Acting), 1975–1977
C. Robin LeSueur, 1977–1982

Associate Director: Mark Hodges, 1967–1970
Mary E. Feeney, 1970–1976
Arlee May, 1977–1982

Region II: New York/New Jersey Regional Medical Library

Director: Gertrude L. Annan, 1969–1970
Thomas G. Basler, 1970–1972
Alfred N. Brandon, 1973–1978
Brett A. Kirkpatrick, 1979–1982

Associate Director: Ann Hutchinson, 1969–1971
Vernon R. Bruette, 1973–1978
Lynn Kasner Morgan, 1978–1980
Kay Mills Due, 1981–1982

Region III: Mid-Eastern Regional Medical Library Service

Director: Elliott H. Morse, 1968–1981
Anthony Aguirre, 1981–1982

Associate Director: Carol C. Spencer, 1970–1972
John A. Timour, 1973–1975
June H. Fulton, 1975–1982

Region IV: Mid-Atlantic Regional Medical Library

Director: Erika Love, 1977–1977
Carol C. Spencer, 1977–1978
Maxine Hanke, 1978–1982

Associate Director: Jackie Rustigian Mikail, 1974–1981
Peggy J. Beavers, 1981–1982

Region V: Kentucky, Ohio, Michigan Regional Medical Library

Director: Vern M. Pings, 1969–1975
James F. Williams, II, 1975–1982

Associate Director: Jean Monroe, 1969–1977
Faith Van Toll, 1977–1982

Region VI: Southeastern Regional Medical Library Program

Director: Miriam H. Libbey, 1970–1982

Associate Director: Mark Hodges, 1970–1972
Eloise C. Foster, 1973–1975
Michael Torrente, 1976–1982

Region VII: Midwest Regional Medical Library

Director: William S. Budington, 1968–1979
Irwin H. Pizer, 1980–1982

Associate Director: Richard Davis, 1968–1972
Chester Pletzke, 1972–1978
Ruby S. May, 1978–1982

Region VIII: Midcontinental Regional Medical Library Program

Director: Bernice M. Hetzner, 1970–1973
David Bishop, 1973–1977
Robert M. Braude, 1978–1982

Associate Director: Elizabeth Petgen, 1971–1979
Richard B. Pride, 1980–1982

Region IX: South Central Regional Medical Library

Director: Donald D. Hendricks, 1970–1977
S. Joe McCord (Interim), 1977–1978
Jean Miller, 1979–1982

Associate Director: John A. Murphey, 1973–1981
James Pat Craig, 1982

Region X: Pacific Northwest Regional Health Sciences Library

Director: Gerald J. Oppenheimer, 1968–1982

Associate Director: Dale R. Middleton, 1980–1982

Region XI: Pacific Southwest Regional Medical Library Service

Director: Louise Darling, 1969–1979
Gloria Werner, 1980–1982

Associate Director: Nelson J. Gilman, 1969–1971
Phyllis S. Mirsky, 1971–1979
Alison Bunting (Acting), 1979
Robert Bellanti, 1979–1982

Seven Reconfigured Regions

Region 1: Greater Northeastern Regional Medical Library Program

Director: Brett A. Kirkpatrick, 1983–

Associate Director: Kay Mills Due, 1983–1986
Mary Mylenki, 1986–

Region 2: Southeastern/Atlantic Regional Medical Library

Director: Cyril C. Feng, 1983–

Associate Director: Carol G. Jenkins, 1983–1986
Suzanne Grefsheim, 1986–

Region 3: Greater Midwest Regional Medical Library Network

Director: Irwin H. Pizer, 1983–

Associate Director: Ruby S. May, 1983–

Region 4: Midcontinental Regional Medical Library Program

Director: Robert M. Braude, 1983–1986
Nancy N. Woelfl, 1987–

Associate Director: Richard B. Pride, 1982–1983
Carolyn Reid, 1983–

Region 5: South Central Regional Medical Library

Director: Jean Miller, 1982–

Associate Director: James Pat Craig, 1982–1985
Regina Harris Lee, 1985–

Region 6: Pacific Northwest Regional Health Sciences Library Service

Director: Gerald J. Oppenheimer, 1982–

Associate Director: Dale R. Middleton, 1982–

Region 7: Pacific Southwest Regional Medical Library Service

Director: Gloria Werner, 1982–1984
Alison Bunting, 1984–

Associate Director: Darcy D. Van Vuren, 1982–1985
Elaine Graham, 1985–

APPENDIX 2: KEY NATIONAL LIBRARY OF MEDICINE STAFF INVOLVED WITH THE RML PROGRAM

Office of the Director

Director:

Frank Bradway Rogers, M.D., 1949–1963
Martin M. Cummings, M.D., 1964–1983
Donald A. B. Lindberg, M.D., 1984–

Deputy Director:

Scott Adams, 1960–1969
G. Burroughs Mider, M.D., 1969–1972
Melvin S. Day, 1972–1978
Kent A. Smith, 1978–

Deputy Director for Research and Education (formerly Special Assistant to the Director for Medical Program Development and Evaluation):

G. Burroughs Mider, M.D., 1968–1969
Harold M. Schoolman, M.D., 1970–

Associate for Extramural Planning

Estelle Brodman, Ph.D., 1960–1961

Library Operations

Associate Director:

Joseph Leiter, Ph.D., 1965–1983
Lois Ann Colaianni, 1984–

Deputy Associate Director:

James P. Riley, 1967–1968
Samuel T. Waters, 1969–1970
Erika Love, 1971–1977
James W. Barry, 1977–1980
Lois Ann Colaianni, 1980–1984
Betsy L. Humphreys, 1984–

RML Coordinator:

Sheldon Kotzin, 1978–81
Duane Arenales (Acting), 1982–1983
Becky Lyon-Hartmann, 1984–

Extramural Programs

Associate Director:

Marjorie P. Wilson, M.D., 1964–1967
David F. Kefauver, 1967–1970
Leroy Langley, M.D., 1970–1973
Ernest M. Allen, M.D., 1973–1982
William Cooper, Ph.D., 1982–1985
Arthur Broering (Acting), 1985–

Deputy Associate Director:

Robert A. Walkington, 1970–1973
Arthur Broering, 1974–

Facilities and Resources Division (1966–1973):

Carl Douglass, 1966–1967
Louis S. Gerber, M.D., 1967–1968
Robert Walkington (Acting), 1968
Arthur Broering, 1968–1973

APPENDIX 3: REGIONAL MEDICAL LIBRARY NEWSLETTERS

Original Regions	*Newsletter*
I	*NERMLS News.* Quarterly newsletter of the New England Regional Medical Library Service. Boston, MA, no. 1, Jan/Mar 1970-no. 56, Aug 1982.
II	*New York and Northern New Jersey Regional Medical Library News.* New York, NY, v. 1, Aug 1971-no. 5, May 1974.
	New York and New Jersey Regional Medical Library News. New York, NY, v. 1, Oct 1976-v. 6, Oct 1982.
III	*MERMLS News.* Newsletter of the Mid-Eastern Regional Medical Library Service. Philadelphia, PA, v. 1, Jan 1970-v. 13, Nov 1982.
IV	*RML IV. Mid-Atlantic Regional Medical Library Program. Newsletter.* Bethesda, MD, no. 1, Apr 1974-no. 42, Nov/Dec 1982.
V	*KOMRML Commentary.* Detroit, MI, v. 1, 1976.
	KOMRML. Kommentary. Detroit, MI, v. 1, May 1977-v. 2, Mar 1979.
	KOMmentary on the kentucky ohio michigan regional medical library network. Detroit, MI, no. 1, Summer 1979-no. 7, Winter 1982.
VI	*Program Notes.* Southeastern Regional Medical Library Program. Atlanta, GA, no. 1, Jan 1971-no. 40, Dec 1982.
VII	*News Notes.* Midwest Regional Medical Library. Chicago, IL, no. 1, Aug 1969-no. 15, Dec 1972.
	Resources. Midwest Health Science Library Network. Chicago, IL, v. 1, Autumn 1973-v. 9, Dec 1982.
VIII	*Octasphere.* Newsletter of the Midcontinental Regional Medical Library Network. Omaha, NE, v. 1, Feb 1973–.
IX	*Synergy.* Newsletter of the TALON Regional Medical Library Program. Dallas, TX, v. 1, Feb 1970–.
X	*Supplement.* Newsletter/Pacific Northwest Regional Health Sciences Library. Seattle, WA, Mar 1970–.
XI	*Pacific Southwest Regional Medical Library Service Newsletter.* Los Angeles, CA, no. 1, Oct 1969–.
Reconfigured Regions	
1	*Greater Northeastern Regional Medical Library Program Newsletter.* New York, NY, v. 1, Feb 1983–.
2	*SEA Currents.* Newsletter of the Southeastern Atlantic Regional Medical Library Service. Baltimore, MD, v. 1, Mar 1973.
3	*3 Sources.* The Region 3 newsletter. Greater Midwest Regional Medical Library Network. Chicago, IL, v. 1, 1983–.
4	*Octasphere.* Newsletter of the Midcontinental Regional Medical Library Network. Omaha, NE, v. 1, Feb 1973–.
5	*Synergy.* Newsletter of the TALON Regional Medical Library Program. Dallas, TX, v. 1, Feb 1970–. (Effective with v. 14, 1984 the subtitle changed to Newsletter of the South Central Regional Medical Library Program.)
6	*Supplement.* Newsletter/Pacific Northwest Regional Health Sciences Library. Seattle, WA, Mar 1970–. (Effective 1983 the subtitle changed to Newsletter/Pacific Northwest Regional Health Sciences Library Service.)
7	*Pacific Southwest Regional Medical Library Service Newsletter.* Los Angeles, CA, no. 1, Oct 1969–.

APPENDIX 4: EXPERTS CONSULTED AND EXPERT REVIEWERS

Experts Consulted

Gertrude L. Annan
Duane Arenales
Thomas G. Basler
Alfred N. Brandon
Estelle Brodman
Arthur J. Broering
William S. Budington
Lois Ann Colaianni
William G. Cooper
Mary E. Corning
Martin M. Cummings
Louise Darling
Myrl Ebert
Donald D. Hendricks
Bernice M. Hetzner
Samuel Hitt
Mark Hodges
Mary M. Horres
Ann P. Hutchinson
Frances E. Johnson
Sheldon Kotzin
Joseph Leiter
C. Robin LeSueur
Erika Love
Becky Lyon-Hartmann
Lucretia McClure
Erich Meyerhoff
Jackie Rustigian Mikail
Elliott H. Morse
Vern M. Pings
Harold M. Schoolman
Kent A. Smith
Richard T. West
Marjorie P. Wilson

Expert Reviewers

Duane Arenales
David Bishop
Susan Crawford
Louise Darling
June H. Fulton
Suzanne Grefsheim
Mark Hodges
Brett A. Kirkpatrick
Sheldon Kotzin
C. Robin LeSueur
Becky Lyon-Hartmann
Jackie Rustigian Mikail
Jean Miller
Phyllis S. Mirsky
Gerald J. Oppenheimer
Raymond A. Palmer
Irwin H. Pizer
Carolyn Reid
Kent A. Smith
Faith Van Toll
Pat L. Walter