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STRENGTHENING OF THE BRAZILIAN BIOMEDICAL

INFORMATION NETWORK

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At last year's meeting of the PAHO Advisory Committee on Medical Research, a paper by Dr. Martin C. Cummings, Director of the U.S. National Library of Medicine (NLM), traced the history of the PAHO Regional Library of Medicine and the Health Sciences (RLM) and discussed the Pan American Health Organization's prospects for developing an inter-American Biomedical Communications Network (PAHO/ACMR 12/3, 1973). Dr. Cumming's report also mentioned plans for testing the MEDLINE system in Brazil and for creating an audiovisual program at RLM.

Today I would like to report on the status of these two projects.

The MEDLAR system for batch processing of biomedical bibliographic searches has been in use in Brazil since November 1973. It is located at the Computer Center of the State of São Paulo's Atomic Energy Institute (AEI), on the campus of the University of São Paulo, some 6 miles from RLM. Two hours of computer time per week are leased from AEI's IBM 370/155 Computer for this purpose. NLM provides the program and the data base, updated monthly. From November 1973 to March 1974, 821 bibliographic reference searches were performed with this system. In addition, 117 searches were generated for selective dissemination addressees.

In March 1974 with further technical assistance from NLM, on-line operation was initiated within the AEI Computer Center, first with one, and then two terminals time-sharing the computer. Thus, on-line operation became a reality.

Geographic deployment of the system within Brazil was the next objective. Financial assistance from the United Nations Development Program (UNDP), the Brazilian Ministries of Health and of Education and

Culture, and from the State of São Paulo was received for this purpose early this year. Added to PAHO's own investment of resources and to the extensive technical involvement of NLM, these contributions are making possible the developments described below.

In his paper last year, Dr. Cummings emphasized the experimental character of the initial MEDLINE installation in Brazil. Experimentation is necessary because the communications environment of Brazil is different from that in the United States.

Whereas distributed, time-shared communications networks such as TYMNET and the network of the Advanced Research Projects Agency (ARPA) have served on-line data transmissions in the United States for several years, communications networks in Brazil are not yet as highly developed. The Brazilian two-tier communications system consists of long-haul microwave and troposcatter voice channel plus some high-frequency channels, as shown in the slide, and intracity telephone lines. To transmit data regularly from one city to another, the Brazilian telecommunications utility EMBRATEL recommends part-time lease of an intercity microwave channel and full-time lease telephone lines--dedicated lines--within the cities at each end.

The MEDLINE/Brazil deployment, which started with an experimental phase now in progress, intended to collect communications design data and to simulate and analyze various future systems configurations and systems management plans. A limited network is being activated for this purpose for use through September 1974. As shown in the slide, this network consists of (a) a management center at RLM; (b) the IBM 370/155 computer at AEI; (c) single terminal consoles at RLM, the Central Biomedical Library at the Federal University of Rio de Janeiro--complementing there the facilities of PAHO's Latin American Center of Educational Technology for Health (CLATES), the Central Library of the National University of Brasília, and the Central Medical Library of the Federal University of Pernambuco at Recife; (d) dedicated city telephone lines in São Paulo, Brasília, Rio de Janeiro, and Recife; and (e) voice-microwave channels radially linking the last three cities to São Paulo.

This experimental MEDLINE network will be operated initially for about 30 to 60 minutes per week, time-sharing the computer. The terminal at RLM will be used for 2 to 3 hours for testing, training, and batch processing.

The second phase of MEDLINE/Brazil deployment will start in September. Terminals and communications links will be added progressively, and include Belém and Fortaleza in the Northeast; Salvador, Belo Horizonte, and Niteroi in the Center East; and Curitiba and Pôrto Alegre in the South. Additionally four cities in São Paulo State will also receive MEDLINE service: Campinas, Ribeirão Preto, Botucatú, and Sorocaba.

Two problems arise in connection with the second-phase deployment.

First, the number of MEDLINE terminals that can be served simultaneously, and the total hours of MEDLINE use are limited by the physical configuration of AEI's computer system. To resolve these limitations, we are exploring with AEI ways of increasing computer capacity; and separately, we are looking for alternative or supplemental sources of computer time elsewhere.

Second, are the more difficult questions of relating network expansion to user needs and of integrating MEDLINE into other library operations in Brazil. The experience now being acquired in phase I should help to answer these. Subsidiary issues include the setting of fees for MEDLINE service, the alignment of the data base to Brazilian requirements, and the selective enrichment of library collections.

Beyond phase II of MEDLINE deployment in Brazil is the ultimate goal of extending the network to other Latin American countries. While it would be premature at this time to advance a detailed plan, it is likely that physical deployment will start with an experimental link joining a MEDLINE computer in Brazil to a terminal outside Brazil, perhaps in Venezuela.

A significant development expected beyond phase II is the availability of time-shared data communications systems in Brazil, perhaps within the next 2 years. A Brazilian company is being organized for this purpose. The system will bring substantial operating cost savings to MEDLINE.

A forthcoming addition to MEDLINE is a file now being prepared by NLM that will enlarge the data base to include citations of audiovisual materials. Although it may be another year or more before this file is made available to MEDLINE users, it is potentially of great value to Brazil where the use of audiovisuals, particularly in education, is drawing considerable attention. For RLM and its subcenters, which are starting essentially from scratch in audiovisuals, it should prove especially useful in responding to users needs.

As of January of this year, audiovisual collections on hand at RLM totaled less than 100 audiovisual packages consisting mostly of 35-mm transparency series and audio tapes. Playback equipment amounted to one slide projector and one hand-held slide viewer. However, RLM already had facilities--a conference room, several seminar rooms, smaller study rooms, and carrels--ready for use and requiring only slight modification to improve acoustics, ventilation, and illumination control.

A set of guidelines given to RLM by its Advisory Committee, define the audiovisual unit's role as a demonstration, training, and software dissemination center complementing and reinforcing RLM's library functions as the hub of a regional biomedical information network. RLM is not involved and has no plans to be involved in the production of audiovisuals (AV's). Our role is to acquire and disseminate AV's. Dissemination may involve loans or reproductions depending on the level of demand and on costs. We are conducting analyses in this area in order to evolve a practical system.

As in the case of MEDLINE, support of RLM's audiovisual activity is provided by a UNDP grant and by contributions from the Brazilian Ministries of Health and of Education and Culture. Technical assistance is provided by NLM's National Medical Audiovidual Center (NMAC) in Atlanta, Georgia. NLM is also making available to RLM free-of-charge NMAC's vast audiovisual collections of 16-mm films, video tapes and 35-mm transparencies.

The first concerns in developing RLM's audiovisual unit were (1) to acquire the equipment required to play the software, and (2) to define a software acquisition policy appropriate to the unit's objectives.

The choice of equipment has emphasized the necessity to limit and standardize software formats so as to reduce user costs and facilitate software dissemination. At present, automatic 35-mm transparency projectors synchronized with audiotape players account for the bulk of RLM's recent hardware acquisitions. We also have one video tape (VT) cassette player and several monitors, and plan further acquisitions of VT players. VT is a very flexible and economic medium, even though the lack of electronic compatibility between the Brazilian, American, and European TV systems requires conversion for use of non-Brazilian and audiovisual stock on Brazilian monitors. We plan to use EMBRATEL's conversion center in Rio de Janeiro for this function.

Unlike its subcenters, RLM is involved in AV software acquisitions from foreign sources for evaluation before dissemination to Brazilian users. Thus in addition to the equipment just mentioned other pieces of equipment are needed that will not be part of the typical AV subcenter installation. These include a 16-mm optical and magnetic movie projector and U.S. type color video monitors.

The acquisition of AV software raises the question as to what are RLM's specific AV objectives within the broad goal of assisting biomedical researchers, educators, and practitioners. There is a great multitude of materials to choose from, but upon close inspection, much of the offerings may not be suitable to specifically defined objectives.

There is now underway in PAHO, with the assistance of other agencies and most notably the W. K. Kellogg Foundation, a very strong and integrated effort to assist Latin America in restructuring medical education programs. A significant part of this endeavor emphasizes the use of multimedia instructional techniques and self-instruction. Production of software is centralized in CLATES/Rio de Janeiro and CLATES/Mexico, under the guidance of CLATES/Washington.

Existence of this effort provides a natural orientation for RLM's AV activities in respect to education. Although it will be sometime before evaluated AV instructional units are produced and evaluated by CLATES, AV material produced outside of Brazil, especially the NMAC material

already evaluated for U.S. medical school use, constitutes an immediate and important supply of potential value to Brazilian as well as other Latin American medical colleges.

To determine suitability of this material and to make a selection, RLM has undertaken to enlist the expertise and advice of the Brazilian Association of Medical Schools, and through them of the leading Brazilian associations of medical specialties.

The same approach will be used to help guide RLM's involvement with AV's in support of medical practice and medical research. Well advanced in this respect is a project to create an integrated computer listing, using the TMEF code, of the principal pathology collections in Brazil. It will greatly facilitate access by researchers and practitioners to specific cases and patient histories.