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DEVELOPMENT OF MEDLINE IN BRAZIL

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MEDLINE (MEDLARS-on line)/BRAZIL is the teleprocessing system established in São Paulo by the Pan American Health Organization with support from the U.S. National Library of Medicine (NLM), the United Nations Development Program (UNDP), and the Government of Brazil. It provides: (1) computerized biomedical bibliographic reference services to the major cities of Brazil, and (2) a MEDLINE-derived areawide service of selective dissemination of information (SDI).

The data base of this NLM-developed system contains indexed citations from over 1,200 of the world's leading biomedical journals, which the powerful ELHILL II program can make instantly accessible for rapid search and retrieval, on-line or off-line. The data base is updated by tapes received monthly from NLM.

Other components of MEDLINE/BRAZIL are the IBM 370/155 computer and 3704 communications controller leased part-time from the State of São Paulo's Atomic Energy Institute (AEI); the telecommunications network assembled from voice circuits leased from the Brazilian communications utility EMBRATEL and its affiliated state companies; and electronic data terminals situated in Brazilian cities, mostly at biomedical libraries or central libraries of federal universities.

The SDI program is a monthly bibliographic distribution service by mail based on MEDLINE searches, with backup photocopying of a limited number of cited articles, all in specific subject areas preselected by the users.

The MEDLINE software was first installed in São Paulo in late 1973 and used locally at the computer site (AEI) until the network was created.

Design and development of the teleprocessing system began in March 1974 supported by a U.S. $190,000 grant**from the UNDP to the Government of Brazil.

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**This grant also supported the establishment, completed in June 1975, of an audiovisual center at RLM.

The project has been managed jointly by PAHO--through the Department of Research Development and Coordination--and the Escola Paulista de Medicina, the latter on behalf of the Brazilian Ministry of Education.

Network operations started in September 1975, the system consisting of the AEI computer and one remote terminal at the PAHO Regional Library of Medicine and the Health Sciences (RLM). Today MEDLINE/BRAZIL reaches 7 major cities, including Brasília. Two more cities will be included during the next 6 weeks.

The SDI program now serves 568 users monthly at Belo Horizonte and in the states of Rio Grande do Sul and Rio de Janeiro. A choice of 151 biomedical subject areas is offered to the users at time of subscription.

Although MEDLINE/BRAZIL retains an experimental character during its present period of rapid expansion, demand statistics indicate that the services provided--both on-line and SDI--are considered valuable and timely by a growing number of users. Despite the Cr$85 (about US$8.25) currently charged per bibliography of 25 or fewer citations--corresponding prices in the United States are $11.00 for the first 12 minutes, and $1.25 for each additional 5 minutes--much of the demand for bibliographies comes from second- or third-time users.

As can be expected, demand for MEDLINE bibliographies is highly correlated with major urban areas, such as São Paulo, Rio de Janeiro, or Pôrto Alegre, which are rich in biomedical journal collections. Correlation is also high for locations not as well endowed in journals but situated within 2 to 4 day's mail reach of a well-endowed library. This latter situation prevails in many of the smaller cities of São Paulo State.

By contrast, the demand for SDI service--the cost is Cr$432 or US$41.85 for 6 months--is widespread both in urban and rural areas (in Rio Grande do Sul, 67 percent and 37 percent respectively).

The present relatively high cost of MEDLINE/BRAZIL bibliographies is explained by the proportionately higher cost of telecommunications compared to computer costs in Brazil than, for example, in the United States.

This is due, first, to higher line costs per km resulting from Brazil's 30 percent communications development tax applied to all tariffs; second, from the high average computer-to-terminal line distance (930 km) characteristic of the early growth of a sparsely "populated" multiterminal system of great geographic spread (3,400 km north to south).

At present Brazil does not have publicly available data transmission systems equivalent to TYMNET, ARPANET, or DATRAN, so that the operating economics attainable with the high traffic density characteristic of these systems is not available. When similar systems appear in Brazil, significant unit cost reductions should result for MEDLINE/BRAZIL.

To keep transmission costs down the system's terminal schedules are coordinated to take advantage of multiplexing on trunks serving many terminals, such as São Paulo - Belo Horizonte - Salvador - Recife - Fortaleza - Belém. Frequency division multiplexing (FDM) is used, all at 300 bps.

As terminal density increases, between São Paulo and Rio de Janeiro for example, it is planned to replace FDM by the higher capacity Time Division Multiplexing system (TDM), a capital investment that will keep operating costs at an acceptable level.

Data transmission over the direct dial system is not presently authorized in Brazil. Consequently all MEDLINE/BRAZIL telecommunications use a combination of dedicated urban voice circuits leased full-time and interurban microwave voice channels leased for at least 2 hours per week, the present minimum allowed by EMBRATEL. In certain locations where the weekly demand for bibliographies is still small, this minimum exceeds needs, causing idle time that can be quite expensive.

To cope with this problem and more generally to help reduce teleprocessing unit costs a number of measures are being implemented or considered:

(1) Addition of complementary data bases such as CANCERLINE and CANCERPROJ.

(2) Use of the network for related, but non-bibliographic purposes. For example, transmission of health statistics and other public health information; remote on-line access of large computers for diagnostic and other biomedical computing purposes.

(3) Sharing of terminals or telecommunications with other computer centers involved in teleprocessing activities. This is being planned, for example, with agriculture information systems, and is expected to benefit also nutrition projects.

In these endeavors, as indeed in the entire development of the teleprocessing system, MEDLINE/BRAZIL has benefited from the extensive cooperation and assistance received from the Ministry of Communications, from EMBRATEL and affiliated state telecommunications companies, from the Atomic Energy Institute of the State of São Paulo and its Data Processing Center, and from EMBRAPA and EMBRATER.

A new development of great significance to MEDLINE/BRAZIL is the establishment of the Instituto Brasileiro de Informação em Ciências e Tecnologia (IBICT). The national charter of this organization is the entire field of scientific and technical information, and its already advanced plans suggest a favorable outlook for the further development of this important network.

Important issues for Brazil and for PAHO are inherent to such developments. Extension of the system to other Latin American countries is one such issue, which will involve, of course, NLM. Another is the adequacy of PAHO's present communications means to serve its information collection and dissemination requirements throughout the Americas.

The rapid progress that may be observed in the development of national teleprocessing information systems in several countries of Latin America would suggest that it is not too soon to examine these issues.