BIREME
and the Latin American and Caribbean System on Health Sciences Information: Towards the Virtual Health Library

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Executive Summary

Over the past 30 years, the Latin American and Caribbean System on Health Sciences Information (Regional System) and BIREME have successfully developed the capacity of countries in the Region to create and operate national scientific and technical information systems in tandem with the emergence of new organizational, and information management paradigms. In recent years, the demand for technical cooperation with respect to Internet-based products and services has required new changes in BIREME and the Regional System.

The obsolescence of the current model coincided with the establishment of the BIREME External Evaluation Commission by the Director of PAHO in July and August 1997, which in its report stated that BIREME had shifted away from its mission as the Coordinating Center of the Regional System. Nevertheless, it recognized the fundamental role that BIREME has played and recommended that its leadership in promoting technical cooperation be strengthened.

The proposal to create and implement the Virtual Health Library (VHL) under the leadership of BIREME, represents the adoption of a new organizational and information management paradigm that will consistently respond to the recommendations of the External Evaluation Commission and to the new demand for technical cooperation.

The VHL represents an expansion of the current technical cooperation model, since it promotes decentralized production and operation of multimedia information sources, connected through networks with direct and universal access, exempt of geographical or scheduling restrictions.

BIREME has established a plan of action to implement the VHL based on 5 lines of action: promotion and marketing; realignment of traditional products and services; production of electronic publications; development of tools for integrating and locating information; and development of other VHL components. The plan of action will be implemented within a three-year period between April 1998 and March 2001.

BIREME and the Regional System: 30 Years of Evolution

The Latin American and Caribbean Region (LAC) is notable for the high degree of development it has achieved in the area of scientific and technical health information.

This development can be measured, along the past 30 years, by the constant and steady increase in the flow of information at the national and regional levels. This, in turn, is the result of the enhancement of the countries' ability to create and operate library systems and documentation centers with increasingly advanced information products and services.

The decentralized and cooperative production of the LILACS database system, which references the scientific literature on health generated in the

Latin American and Caribbean countries, constitutes the best example of the remarkable progress made by the Region in information management. The LILACS/CD-ROM compact disk, which integrates and publishes the results of this cooperative effort, has been updated and published regularly three times a year since it was launched nine years ago, which is a significant achievement.

Also worthy of attention are the countless national and international electronic health information products that the countries of the Region have been developing, acquiring, operating, and disseminating in recent years, thus, significantly expanding the availability of information for the community of health professionals. The vast majority of libraries and information centers are already fully connected to the Internet or will be in the next two years.

This ongoing development is, undoubtedly, the result of a coordinated policy between PAHO and the countries of the Region. Jointly and cooperatively, they have mobilized significant investments and efficiently applied them toward training of human resources and updating of collections of information sources and infrastructure of information technology in an environment characterized by limited resources and economic crisis.

PAHO has played a key role in this development, chiefly through the ongoing action of BIREME, which has become PAHO's operational arm for technical cooperation in scientific and technical information.

BIREME's activity in the Region, in general, may be divided into three stages, each lasting approximately 10 years. Each stage has been characterized by a principal orientation in the promotion of technical cooperation, in keeping with the current organizational and management information paradigms.

Thus, in the first stage, between 1967 and 1976, BIREME's activity was centered on the operation of regional medical library services with a view to responding, on a priority basis, to the needs of the medical libraries of the Region for access to scientific literature.

In the second stage, between 1977 and 1986, BIREME's activity was directed toward the creation and implementation of a network of libraries in the Region, in pursuit of efficient organization and the shared use of their collections. At the same time, bibliographic control of the Latin American journals found in the publication Index Medicus Latinoamericano was implemented through centralized processing. The expansion and enrichment of BIREME's role beyond that of a library was reflected in the change, in 1982, of its original name, from Regional Library of Medicine to Latin American and Caribbean Center on Health Sciences Information.

In the third stage, during the past 10 years, BIREME's activity has been geared toward the creation and implementation of the Latin American and Caribbean System on Health Sciences Information, with active participation of libraries and information centers. In the second half of the 1980s, BIREME brought extraordinary progress with the creation and dissemination of the LILACS methodology to decentralize management of scientific literature; the creation of Descriptors in Health Sciences vocabulary in

three languages; the mass introduction of information technologies; and, particularly, the LILACS/CD-ROM project, and the operation of LILACS and MEDLINE on BIREME's own computers. To expand the coverage and efficiency of the Regional System's operation, BIREME encouraged the creation and implementation of specialized systems in different areas of the health sciences. This progress was consolidated in the 1990s. It should be noted that BIREME's Internet connection and the celebration of regional Congresses, together with the mass participation of health information professionals of the Region and the developed countries, have contributed to an extraordinary exchange of information and sharing of experiences.

Meanwhile, in the past 3 years, with the growing prevalence of the Internet and its WWW service as a means to organize and disseminate information, the operational model of BIREME and the Regional System have been proven progressively unable to sustain the rate of development of information products and services in the Region as achieved in the late 1980s and early 1990s.

It is true that information methodologies, products, and services created by BIREME at the end of the last decade and related mainly to the scientific and technical literature published in hard copy, are still valid. However, the countries currently demand a new type of technical cooperation revolving around the creation and operation of decentralized information sources through the Internet. This type of cooperation, broader in scope and multimedia in nature, with more value added to serve the needs of specific groups of users and with less mediation through interfaces, makes the direct interaction of users with information sources a viable undertaking.

The obsolescence of the BIREME and the Regional System's operational model coincided with the establishment by the Director of PAHO of the BIREME and Regional System External Evaluation Commission, whose work was carried out during July and August 1997. In its report, the Commission points out the key role that BIREME has played, mainly in the implementation of the Regional System. It recommends its consolidation and enhancement as the coordinating center for the Regional System, together with the strengthening of its leadership in promoting technical cooperation in scientific and technical information.

With the objective of analyzing and monitoring the recommendations of the BIREME External Evaluation Commission report, early in October 1997, a working group convened by HDP/PAHO prepared a document proposing the bases for a workplan for PAHO's technical cooperation in health information. This plan was based on the creation and implementation of the Virtual Health Library, originally proposed to the External Evaluation Commission during its examination of BIREME.

BIREME intends to adopt the Virtual Health Library proposal as the platform for the promotion of technical cooperation in information for the coming years, in harmony with the new organizational and information management paradigms established by the Internet. Thus, BIREME will continue to play a leadership role in the Region.

The creation and implementation of the Virtual Health Library is planned as the fourth stage in the BIREME and the Regional System evolution.

The Virtual Health Library for Latin America and the Caribbean

The creation and implementation of the Virtual Health Library (VHL) is the strategy that BIREME intends to adopt for the promotion of technical cooperation in information toward and among the countries of Latin America and the Caribbean. The objective is to provide an organized and efficient response to the emerging needs of the countries to produce and operate health information sources through the Internet.

The Virtual Health Library is envisioned as the broad of scientific and technical knowledge based in health—entered, organized, and stored in electronic format in the countries of the Region, universally accessible on the Internet and compatible with international databases.

The VHL is simulated in a virtual space on the Internet and consists of a collection or network of health information sources in the Region. Users from different levels and locations will be able to interact and navigate in the space of one or more information sources, regardless of their physical location. The information sources are generated, updated, stored, and manipulated on the Internet by producers, integrators, and intermediaries, in a decentralized manner using common methodologies for their integration into the VHL.

The VHL information sources include health information products and/or services, which are divided into six basic types:

a. Traditional information sources, realigned to operate in a network on the Internet:

- The LILACS system databases and other databases of bibliographic references, made available in their entirety on the Internet, with specific elements to serve the different health sciences specialties, and enriched with links to complementary information sources, particularly databases with full texts and on-line services providing hard copies of documents;

- Databases of directories of health entities in the Region, such as people, institutions, and projects, made available on the Internet, with links to the referenced sites when they exist, and provided, by stages, with interfaces for decentralized updating by those responsible for the referenced entities;

- Factual databases, such as those describing chemical and pharmacological substances, genetic sequences, etc. ;

- Numerical health databases, generated by health management systems, vital statistics systems, epidemiological systems, surveys and demographic censuses, etc.

b. Electronic publications, including the traditional types of scientific and technical literature (journals, monographs, government docu-

ments, annals of congresses, theses, and unconventional documents) enriched with hypermedia and organized in on-line hypertext databases. This is the most important component with respect to the expansion of the traditional library of scientific and technical literature;

c. Multimedia and methodological tools to support education and decision-making. In particular, the VHL will promote the development and operation of tools to support continuing education and distance learning;

d. Push/Selective Dissemination of Health Information services, aimed at responding to the information needs of specific user communities; countless services will be created and operated regionally and in a decentralized manner utilizing the VHL databases;

e. News and lists of discussions on national and international health information, particularly on the implementation of the VHL throughout the Region;

f. Integrating components of the VHL:

- DeCS - Descriptors in Health Sciences, health science terminology that will be utilized to index the VHL information sources in a compatible manner. The DeCS contains more than 23,000 terms, organized and classified, in three languages. In addition to the categories defined in the Medical Subject Headings (MeSH) of the U.S. National Library of Medicine, the DeCS includes specific pub-

lic health categories that are necessary for describing the scientific and technical literature of PAHO and the countries of the Region. Under continuous development to respond to the health sciences dynamic, the DeCS is an integral part of the Unified Medical Language System (UMLS) of the NLM which includes, in addition to the hierarchical organization of the concepts and terms, semantic networks with a view to contributing to the development of specialized systems, particularly with respect to access to information sources. Upon promoting the use of the DeCS as the common language of description of VHL information sources, and upon ensuring its compatibility with the MeSH, it will be possible in the future to use the user-friendly interfaces and specialized systems that are in development in research centers in various parts of the world;

- HIL–Health Information Locator, which includes, on the one hand, the common reference methodology for entering information sources in the VHL and, on the other, tools for searching for and/or locating health information sources through the VHL, regardless of their location, organization, media, and operational interface. In order for the HIL to work, each information source should have its own reference registry. The HIL, operating on this basis of reference, becomes the tool for integration and navigation among the information sources. As an analogy, in the VHL the HIL plays a role similar to that of a traditional library reference service. The HIL reference registry and search tools will be compatible with the methodologies for locating information sources from the governments of the developed countries and will permit

integration of the VHL with the global information infrastructure. Thus, the HIL will permit navigation between the VHL and international information sources;

- Common standards and methodologies directed toward the development of information sources; this includes guidelines, manuals, software, etc. that are in common use for the creation, maintenance, and operation of VHL information products and services.

These six types of VHL components constitute the basic models for information products and services to be provided by both the regional and national centers. Their scope will be able to cover local, national, and regional data and needs.

It will also be possible to enrich, schedule, reformulate, and/or translate the basic information sources into new information products and services, with value added, in order to meet more efficiently the information needs of users from specific communities, for example, scientific research and education, health authorities and administrators at the different levels, direct medical care in its different specialties, media, the general public, etc.

The VHL does not represent a break with, opposition to, or a negation of the information achievements, methodologies, products, and services currently operated by BIREME, the Regional System, and other national and regional entities. Nor does it represent the end of BIREME and the Regional System. On the contrary, the VHL represents the expansion of the entire

infrastructure for the information already amassed in the Region. This expansion is not linear. It represents the gradual adoption of a new paradigm of information management that in a variety of ways solves unsolvable problems or problems with very expensive solutions in the current operating model of BIREME and the Regional System. The following are some of the main aspects of this expansion or change in paradigm:

- access to the information sources without scheduling limitations;

- access regardless of the geographical location of the user and the information sources;

- integration of the functions of storage, preservation, and publication; for example, the collection of the issues of an electronic journal in the VHL simultaneously represents the traditional functions of publication, cataloguing, storage, and preservation;

- a supply of "copies" of documents for everyone all the time, overcoming the limitation of the ratio of one document to one reader at a given time;

- coexistence of information sources on traditional media and in hypertext format, including multimedia components;

- the VHL will permit the establishment of national and regional policies and mechanisms for organizing and maintaining the products in electronic format, ensuring their preservation for the future;

- creation of a coherent, highly efficient platform for technical cooperation through the use of common methodologies and technologies

that facilitate and cut the cost of human resources education and the large-scale provision of information products and services;

- promotion of the necessary and sought after integration of different disciplines, specialties, systems, and initiatives in information and health in the design, creation, and operation of information products and services;

- a driving force for achieving the integration, organization, and dissemination of the information resources generated by the research and education systems, the health program management systems, and vital statistics and other statistical systems;

- existence of quality control mechanisms for the selection of information sources for the Library;

- rapid updating of information sources by minimizing the mechanisms that mediate their generation and publication;

- provision of integrated mechanisms in the information sources for the evaluation of their use and impact;

- platform for the creation, development, adaptation, acquisition, and dissemination of information technologies suited to the different conditions and needs of the countries of the region, maximizing their use in promoting implementation and decreasing the information gaps within the countries, among the countries of the region, and outside the region;

- new opportunity and model to support the learning curve in the use of information technologies to replace the current BIREME and Regional System model;

- opportunity to facilitate and promote the transition between the old and new paradigms of information management in the Region;

- mediating element for the coexistence of the old and new paradigms of information management in the region;

- institutions and/or users without access or with limited access to the Internet will also be able to benefit from the VHL through products and services offered on paper, diskettes, CD-ROM, CD-R, and DVD-ROM.

Implementation of the VHL and its development until it reaches momentum will demand political mobilization and increased awareness from the health authorities and institutions of countries in the Region to ensure that the information initiatives and resources are directed toward the VHL on a priority basis.

Cooperation between the authorities and the PAHO leadership is indispensable for making this mobilization a reality. As an operational arm of PAHO/WHO information policy, BIREME will act as a leading center at the regional level in the promotion and implementation of the VHL, through the creation of strategic alliances and consortia.

Thus, technical cooperation provided by PAHO in regard to scientific and

technical information, especially through the activities of BIREME, should be redirected toward implementation of the VHL. In particular, it will fall to BIREME to promote discussion and promotion of the VHL in the centers of the Regional System, so the national systems begin their transition as soon as possible toward the creation and operation of the VHL with local information products and services.

BIREME has established the following lines of action for the implementation of the VHL, in close cooperation with the countries and the PAHO programs:

a. Mass promotion of the VHL in the countries, at PAHO, and in the Region as a whole, with a view to establishing alliances, redirecting resources, and mobilizing new resources, including:
  - the Latin American and Caribbean System on Health Sciences Information;
  - the various PAHO agencies involved in technical cooperation in information, including the Programs, the Pan American Centers, and Representative Offices;
  - the national authorities in the sphere of health;
  - the national science and technology institutions;
  - regional technical cooperation institutions related to science and technology;
  - national and international health promotion agencies.

b. Realignment of the information products and services that currently exist in the Region, so they work within the VHL, including:
  - access to databases via the Internet / WWW utilizing a common operating interface;

- implementation of the procedure for requesting photocopies via the Internet;
- human resources education to support the realigned products and services.

c. Development of electronic publications in the Region utilizing a common methodology for their preparation, storage, dissemination, and evaluation, including, on a priority basis:
  - human resources education in electronic publications methodology;
  - creation of the electronic journal database on health sciences;
  - creation of databases of government publications on health in electronic format.

d. Development of the Health Information Locator, including:
  - establishment of the common reference registry of information sources;
  - development of the search tools;
  - implementation of the HIL.

e. Forging of alliances and development of consortia for establishing and implementing projects for the development of the other components of the Virtual Health Library, including:
  - tools to support education and decision-making;
  - push services/selective dissemination of information;
  - health information news centers and agencies.

Each of these lines of action involves different degrees of development and adaptation of the information methodologies and technologies appropriate to the Region, mobilization of institutions and professionals, training of

human resources, and improvement of the national health information infrastructures.

Plan of Action for Implementation of the Virtual Health Library

This plan of action is on the lines of action established by BIREME for implementation of the Virtual Health Library.

The plan is centralized with respect to the actions considered essential for VHL implementation. It is not a question of an exclusive plan, since the VHL operation, at least in principle, is decentralized and autonomous. In this regard, the main objective of the plan is to implement the VHL and sustain its initial development until it acquires its own momentum.

This plan will be discussed within several PAHO entities and at the Regional System Meeting in Costa Rica, with a view to its improvement.

The plan is organized along five lines of action:

- Promotion and marketing of the Virtual Health Library
- Realignment of traditional products and services
- Electronic publications
- Development of the HIL–Health Information Locator
- Development of the other components of the Virtual Health Library

Each line of action is comprised of a series of related macro activities.

For their implementation, BIREME will group the activities of the plan into different projects that will each include a detailed timetable of activities, implementation methodology, and financial resources.

Implementation of the plan is expected within a three-year period, beginning in April 1998, after the Regional System Meeting in Costa Rica. By the end of the period 30 March 2001, the Virtual Health Library should be fully operational.

The following pages present the lines of action of the plan, including a description of the main actions and institutions involved.

Line of Action I. Promotion and Marketing of the Virtual Health Library

# Description of the principal actions	Responsibility and countries involved	Timetable		
		April 98-March 99	April 99-March 00	April 00-March 01
1 Preparation of a background document on the VHL concept and the Plan of Action, "Toward the Virtual Library" for presentation and discussion at the VI Meeting of the Latin American and Caribbean System on Health Sciences Information, to be held in San José, Costa Rica, at the end of March 1998. This document, to be prepared by BIREME, will be complemented by documents and presentations by the Centers of the Regional System on specific aspects of VHL implementation. Based on this document, the national systems will prepare the national plans and projects for creation and implementation of the VHL with national health information sources. Similarly, the specialized regional systems, the information systems linked to PAHO programs, and the PAHO information centers can prepare plans and projects for their integration into the VHL. In addition, this document will serve as a reference for the preparation of articles and lectures to spread the word about the VHL.	BIREME Regional System			
2 Preparation and implementation of a VHL promotion and marketing plan to familiarize professionals and the health and information area authorities of the region and national and international technical cooperation agencies with the concept and the proposed Plan of Action. This will include marketing activities, products, and strategies. Program implementation will be carried out by BIREME, the Regional System Centers, and the PAHO programs, and will include all possible dissemination mechanisms, such as direct mail, congresses and meetings, posters, Internet sites, etc.	BIREME Regional System PAHO Programs			
3 Sensitization of national authorities at the different levels to the importance of the VHL, with a view to accelerating a redirection of activities and resources toward its construction and development. Sensitization of health promotion and cooperation agencies, with a view to directing project approval and the investment of new resources toward the VHL.	Director PAHO PAHO Programs PWR BIREME Regional System			

Line of Action II. Realignment of Traditional Products and Services

# Description of the principal actions	Responsibility and countries involved	Timetable		
		April 98-March 99	April 99-March 00	April 00-March 01
1 Training courses and technical assistance for implementation of cooperative information services via the Internet in the countries, utilizing a common interface. Also includes the PWRs' and Pan American Centers' information systems. These services will provide access to bibliographic databases, directories, etc. and access to the original document. Includes missions to 8 countries, 1 for Central America and the Latin Caribbean and 1 for the English speaking Caribbean. The training courses will be offered in cooperation with the national coordinating centers, the national commissions on science and technology, the Pan American Centers, and PAHO programs	BIREME Regional System PWRs Pan American Centers PAHO Programs	▦▦▦▦		
2 Implementation of a common interface on PAHO's Web site for cooperative services to access bibliographic databases and the original document	BIREME HBI PAHO Programs	▦▦▦▦		
3 Monitoring actions 1 and 2 via the Internet and missions to the countries	BIREME Regional System HBI PAHO Programs		▦▦▦▦	

Line of Action III. Electronic Publications

# Description of the principal actions	Responsibility and countries involved	Timetable		
		April 98-March 99	April 99-March 00	April 00-March 01
1 Implementation of the common LILACS methodology for electronic publication of all types of scientific literature (journals, monographs, annals of congresses, theses, government documents), starting with the electronic journals project in development by BIREME (SciELO) and pilot implementation in 3 countries.	BIREME Argentina and Chile			
2 Cooperative implementation and operation of 100 titles of Latin American and Caribbean electronic journals on health. Decentralized training and operation in at least 10 countries. This project involves alliances and associations with the national commissions on science and technology and science publishers.	BIREME Regional System CONICYTs Editors			
3 Cooperative implementation and operation of databases for monographs, especially government documents. Decentralized training and operation in at least 7 countries. This project involves the active participation of the ministries of health.	BIREME Regional System PAHO Programs			

Line of action IV. Development of the HIL–Health Information Locator

# Description of the principal actions	Responsibility and countries involved	Timetable				
		April 98-March 99		April 99-March 00		April 00-March 01
1 Definition and preparation of the methodology for the HIL registry and of the tools for retrieval from VHL information sources. Pilot implementation in Cuba and BIREME. Presentation and discussion of the HIL at the VI Meeting of the Latin American and Caribbean System on Health Sciences Information to be held in San José, Costa Rica. Development, improvement, and maintenance of the methodology in keeping with international progress in information source locator methodologies and systems.	BIREME CCN of Cuba Regional System	▨	▨			
2 Pilot implementation of HIL in 3 countries.	BIREME CCN of Cuba Regional System	▨	▨			
3 Training and technical assistance in the utilization of HIL methodology for the entry of information sources in the VHL and implementation of national servers for operation of the HIL entries. Mission in 8 countries, 1 for Central America and the Latin Caribbean and 1 for the English-speaking Caribbean. Includes specialized regional information systems.	BIREME Regional System PWRs			▨	▨	▨

Line of Action V. Alliances and Consortia for the Development of Other VHL Components

# Description of the principal actions	Responsibility and countries involved	Timetable					
		April 98-March 99		April 99-March 00		April 00-March 01	
1 Definition and preparation of a basic set of projects for the development, selection, procurement, and utilization of support tools for education and decision-making. Mobilization of resources for their implementation. The projects should focus on tools with high visibility and broad application that can serve as models to promote decentralized development. This action goes beyond the traditional scope of BIREME and the Regional System and will demand the establishment of alliances, consortia, and cooperative agreements with other entities in the area of health and scientific and technical information.	BIREME Regional System Research and development Institutions of the countries, PAHO Programs	▓	▓	▓	▓	▓	▓
2 Development of the methodology for Selective Dissemination of Information (SDI) on health based on the Internet PUSH methodology. Pilot operation of the methodology within BIREME and establishment of cooperative projects with specialized institutions in the area of health in Latin America and the Caribbean for implementation and decentralized operation of PUSH/SDI servers. The SDI/PUSH services should evolve rapidly toward self-sustainability.	BIREME Regional System PAHO Programs	▓	▓	▓	▓	▓	▓
3 Promotion of news centers and/or agencies on the subject of health information and in particular on the implementation of the Virtual Health Library. The news centers and/or agencies will be able to cover specific health areas, for example, news on environmental information. Institutions and consortia of institutions will operate the news centers and/or agencies.	BIREME Regional System Health and communication institutions			▓	▓	▓	▓

The VHL implementation plan has already made progress and taken constructive preliminary steps that make it possible to anticipate a high degree of success in its implementation:

a. Progress in the formulation of the VHL for Latin America and the Caribbean as the platform for technical cooperation in health information among and toward the countries of the region. The reaction to the VHL has been extraordinarily positive in the various presentations that BIREME has made to specialized audiences;

b. The emerging demand of the countries of the region for technical cooperation that the VHL will efficiently address, mainly with regard to overcoming and reducing information gaps among the countries of the region and between them and countries outside the region, using appropriate technologies;

c. BIREME's development of methodologies and technologies for operating Internet information sources makes it feasible to begin an immediate realignment of the traditional products and services of the regional system centers so they operate in a network;

d. The methodology for the preparation, storage, dissemination, and evaluation of electronic journals, whose development BIREME is completing jointly with FAPESP and 10 Brazilian scientific editors, makes it possible to put the databases of electronic health science journals into immediate operation;

e. Together with the CCNs of the Regional System, BIREME is promoting cooperative programs for the development of VHL components;

f. Implementation of the project for the cooperative development of the Health Information Locator (HIL) by the National Coordinating Center of Cuba and BIREME;

g. BIREME is participating in a consortium with the library systems of the public universities of São Paulo for the procurement and operation of electronic journal collections from commercial publishers; this project involves a total of approximately US$1.5 million; the experiences in the implementing this consortium will be transferred and shared, as will information on other activities in the region;

h. The preparation of the BIREME internal reorganization plan. Implementation of this plan will promote the redirection of human and financial resources to units devoted to technical cooperation, minimizing the activities connected with the local library;

i. BIREME is updating its entire information technology infrastructure with the PAHO extrabudgetary funds provided at the end of 1997; this will make the efficient operation of databases and the regional cooperative services a viable undertaking.

Finally, we should point out the ability of BIREME and the Regional System, demonstrated over the past 30 years, to promote the changes necessary for the adoption of new paradigms, as is the case with the creation and implementation of the VHL.