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**The Virtual Health Library and the Remodeling  
of the Health Scientific and Technical Information Flow  
in Latin America and the Caribbean**

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## **The Virtual Health Library and the remodeling of the health scientific and technical information flow in Latin America and the Caribbean ( )**

### **1. Information centres in the remodeling of the information flow**

The 8<sup>th</sup> International Congress on Medical Librarianship, through its program and particularly its "Converge on London" lemma, celebrates with unique opportunity and precision the remodeling of the structures of the flow of scientific and technical information that is taking place worldwide.

The remodeling process relies on the progressive confluence of the activities of different players, instances and events involved in the scientific and technical information flow around Internet common virtual spaces that favor decentralized actions. The remodeling is centered on the breakdown of rigid structures to smooth interfaces and facilitate the flow of information.

The traditional structure of information flow is carried out by means of physical objects, i.e., books, journals, etc., through a sequence of singular events that occurs at different times and spaces, each one controlled by one or several instances that convey restrictions to the information flow related to organizational structures, politics and policies, economics, ownership, procedures, etc. For example, in the last three years, an article submitted to a Latin American scientific journal indexed in LILACS and MEDLINE databases takes in average of more than one year to be visible and accessible to the public after the authors, editors, referees, publishers, indexers, database aggregators and information centres have carried out the information from one point to the next. The information flow is also affected by a series of interruptions (a break in continuity) in the sense that the flow is not fully accomplished or it is accessible only to restricted user communities. These losses of continuity may encompass inequities. If we consider that the access to scientific information is a condition for the development of health, the traditional information flow indeed needs an advanced remodeling in order to provide equitable and universal access information flows.

Internet is a universal communication instance that provides virtual spaces in a new dimension where the flow of information may occur with no exchange of physical materials, but via electronic files whose content development the players can share. The trend is towards the establishment of a continuum from the author to the end user through the progressive minimization of restrictions that characterize the traditional passage of information objects from one instance to the other.

The remodeling of the information flow is planetary and universal, in terms of geography and subject areas. It applies both to developed and developing countries. In particular, it affects all health-related information. In addition, the process extends beyond the classical scientific information cycle inside the academic communities due to the increasing demand for the availability and application of scientific knowledge from new social instances, especially to support decision making process. In consequence, the remodeling process conforms an extraordinary movement that is reshaping the entire scientific and technical information flow among scientists, professionals, students, authorities, managers, and the general public. What selected players of the classical information cycle were used to do isolated both geographically and chronologically, the new model promises to operate in the same place with a high degree of simultaneousness and incorporating new players.

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Information centres, including libraries, documentation and information centres in general, are functionally and literally in the centre of this remodeling movement. As a consequence, radical changes are taking place in their classical *modus operandi* based on the management of local stocks of information sources, in the form of books, journals, etc. In particular, as Internet provides users with direct interaction with network of information sources, many of the intermediation work information centres did in the past simply disappear in the new model. In addition, information centres are being called to work closed with other information flow players.

During the last three decades, the classical operation of information centres has been deeply influenced and improved by the intensive usage of information technology oriented to add value to their products and services. However, the remodeling of the information flow demands changes that go far beyond the sole improvement of its classical internal functions, such as collection development, technical processing, circulation, reference service, etc., which constitute *per se* singular internal instances in the information flow that occur at different times and spaces inside the information centres. Each one of these internal instances conveys restrictions that are added to the total restrictions the information centre poses on the overall information flow. Internet promotes the minimization of these restrictions as the information centre functions are developed in the Internet and Intranet common spaces shared by the different players, including end users.

As a matter of fact, the challenge of information centre classical functions is under way. Nonetheless, the ultimate objectives of the information centres remain the same as their functions continue to be driven by the demand of providing their clientele with efficient access to relevant and up to date information sources. What is being changed radically is the fact that the information sources to be intermediate may be locally or remotely stored. What matters nowadays is the access, not the actual possession of information sources. In consequence, the information centre strategies, policies, management and procedures are now being directed by the search of a dynamic ideal balance between local holdings and the access to collections located elsewhere. And this balance progressively favors the remote access approach as most of the new information sources — literature, multimedia, maps, etc. — are produced, stored, and published on the Internet. There is no doubt that this trend affects the very essence of the classical information centre organization, originally designed to manage collections of books, journals and other materials stocked inside walls.

Under the new model, the collections accessed by information centres may vary in size from zero locally stored resources to boundless or infinite sized collections distributed over the Internet. A collection will tend to an infinite size when it intends to cover all information sources related to a subject area or to a clientele. In the paper-based world, the interlibrary loan services provide the sharing of collections. But, the concept of boundless collections is only possible with the concurrence of the Internet. They are conformed and operated through networks of decentralized collections, which may include a combination of paper and electronic based collections.

The emergence of information centres holding infinite sized collections permits us to dream or project a future world where scientific and technical information, at least in the health field, will become universally available and accessible. Infinite sized collections are progressively

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becoming available within limited geographical or thematic areas. A current example is the provision of fully access to remote electronic journal collections from a campus Intranet.

It is important to note that infinite sized collections are conceived here as the dynamic provision of access to networks of distributed Internet information nodes or sites. It does not rely on the presence of Internet sites that solely intend to centralize the operation of all information sources in a given subject. Centralization approaches will certainly occur in different scales especially during the period of transition. In developing countries, centralization approaches may prevail for a while due to the lack of information technology infrastructure. However, centralization is contradictory to the information flow through the Internet, which in its essence promotes and potentiates the equitable provision of information sources from different cultures, languages, information needs, etc.

The progressive adoption of the access approach towards infinite sized collections will interfere in all information centre functions. It is expected that technical processing turns to a minimum as the network Internet based information sources appear pre-catalogued with all related metadata. The actual control of holdings will diminish or completely disappear, as there is no sense to control individual items of remote networked collections, such as the case of the kardex control of holdings of journal individual issues. When local holdings are still present, the circulation of objects will be required to be serviced through the Internet in order to provide users with integrated access to local paper based materials and networked electronic materials. It is possible to envisage the traditional operation of these local holdings making use of remote operated catalogue and circulation control.

It is expected that the availability of infinite sized collections will increase in the coming years. Therefore, the growth of local holdings will decrease. This trend will promote the emergence of information centres with no local holdings, so the functions directly linked to such holdings will disappear. In this context, what prevails is the pure access to remote networked information sources. Individual users not requiring intermediation are the natural operators of these contexts. So, if on one extreme, the information centre providing access to an infinite collection tends to coincide with the network, on the other extreme, the information centre with no local holdings tends to coincide with the individual user. Unfortunately, for a long time in the future, most people, including professionals, will not be fully connected, especially in developing countries. This unequal connection to Internet is creating an enormous vacuum or demand for intermediation, which is expected to be filled by renewed information centres dedicated exclusively to interface isolated communities with the Internet.

The access model is becoming predominant as new generated information sources will be readily available on the Internet, and as past generated information sources, which are stored in any media feasible to be converted in digital form, will also be available on the Internet. Even the paper based book that many claims will never reach the same functionality in digital form, is being harassed by new emerging ebook solutions. In addition, it is also expected that the traditional isolated and self-contained information sources will progressively loose importance, as the information flow becomes hypertext based.

In many cases, the information centre classical organization and functionality will certainly survive during the transition period. But, in the long term, it will only last to serve those cases where local holdings are unique or need to be preserved in the original media. The actual pace

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of the reshaping of the information centres is dictated by the pace of the remodeling of the entire information flow. It is important to remember that all players, events and instances related to the scientific and technical information flow are being transformed through the same convergence process.

Independent of the remodeling pace, it is not difficult to envisage a future scenario where the information centres will emerge completely amalgamated on the Internet, together with other players. The information centres will operate as an integral part of the information flow continuum. The information centre in all its forms — libraries, documentation and information centres in general — will become the network itself. Simply it will not exist outside the Internet. It will exist as a network of information centres or as information nodes. The concept of "centre" or "central" will not literally apply anymore in the new scenario fully driven by networking.

How can we approach and how can we mediate this transition? How can we influence the remodeling process? How can we preserve and enhance the original mandates of information centres in the new information model? How can we influence the remodeling towards the universal and equitable access to scientific and technical information?

These are crucial challenges that are being faced worldwide by governments and international agencies, as well as by different communities of professionals, organizations and stakeholders linked to the flow of scientific and technical information.

Following, we will describe the Virtual Health Library (VHL) cooperative approach to promote and influence the information flow remodeling in Latin America and the Caribbean (LA&C). The VHL is an initiative led by BIREME - the Latin American and Caribbean Centre on Health Sciences Information, a specialized centre of the Pan American Health Organization, the WHO regional office for the Americas.

## **2. BIREME and the Latin American and Caribbean cooperative network of health science information centres**

BIREME was established in 1967 by an agreement between PAHO and Brazilian governmental institutions related to health, research and education. BIREME's permanent mission is to contribute to the improvement of health in LA&C through the development of national capabilities in the provision and access to health scientific and technical information. This mission is founded on the fact that the universal and equitable access to scientific and technical information is a condition for the development of health.

Its operational strategy is based on technical cooperation among national and international institutions acting in the health information flow, with especial emphasis on information centres, including libraries, and documentation and information centres in general, operating in the context of universities, faculties, research institutes, ministry of health-related institutions, hospitals and clinics, scientific societies, professional associations, and other governmental, non-governmental public and private organizations.

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The expected result of this cooperation is the development of scenarios where decision making on health-related activities – planning, management, research, education, health care – be supported by up to date and appropriate scientific information.

The cooperation led by BIREME reaches all Latin American countries and the majority of the Caribbean Islands with a high degree of continuity and success. In the last decade, this cooperation has been involving directly and indirectly more than 800 information centres. This cooperating initiative is managed in a context called Latin American and Caribbean Health Sciences System, or simply Regional System.

The cooperation activities have been focussed on developing information centre capabilities through networking them around common actions, which are materialized, controlled and evaluated through information products and services, sharing of infrastructures and capacities, and development of human resources and methodologies. The most important achievements of this cooperation are:

- (a) a systematic bibliographic control of the scientific and technical literature operating in geographic and thematic scopes; this activity is concretized around the network of LILACS databases, which are available both on the Internet and through the LILACS/CD-ROM title published quarterly since 1987;
- (b) referential and disseminating services that provide access to international, regional and national information sources; since 1987, all countries of the Region access at least MEDLINE and LILACS;
- (c) an advanced online cooperative system to locate and share documents, operating about 1,500 online transactions daily;
- (d) a common multilingual vocabulary in Spanish, Portuguese, and English, including the entire MeSH terms and structure, complemented by additional categories of terms on public health and homeopathy; Spanish and Portuguese terms are added into UMLS annually;
- (e) continuing education programs for the development of human resources at managerial and technical levels, involving librarians, documentalists, information specialists, systems analysts, scientific editors, professionals, and users; an average of 15 training courses involving about 250 participants are carried out every year;
- (f) the adoption, adaptation and development of common methodologies, tools and procedures oriented to increase the information flow, with the intensive usage of advanced information technologies that are adequate to local conditions; most of the information products and services are endogenous, in order to assure openness and public domain access;
- (g) the interchange of experiences conducted through the daily operation of common products and services, and through periodical seminars, meetings and congresses; representatives of the national and specialized network of information centres meet annually; in addition, every two years the Regional Congress on Health Sciences Information (CRICS) gathers together 500 to 700 health-related information professionals to know, interchange and evaluate relevant experiences, solutions, trends, etc.

Along the last 33 years, this cooperating program has been continuously renewed through the adoption of new models of management, organization, and information technology. The emergence of Internet as the predominant paradigm of information revealed in large extent the progressive obsolescence of the Regional System model that prevailed from 1987 to 1997. Such a model was based on the operation of products and services and the sharing of

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information infrastructures restricted to the physical limits of information centres. A renewal becomes indispensable to follow the radical remodeling of the information flow, which is taking place worldwide in all subject areas.

The new model of cooperation – the Virtual Health Library (VHL) – was formulated by BIREME, and discussed, improved and formally adopted by the representatives of the information centres during the VII Meeting of the Regional System that took place in San José, Costa Rica, in March 1998. The decision was solemnly expressed in the Declaration of San José "Towards the Virtual Health Library".

### **3. The VHL - remodeling the flow of health sciences information in LA&C**

The Virtual Health Library (VHL) is the new model of the technical cooperation in health scientific and technical information throughout LA&C led by PAHO through BIREME.

Whilst a cooperation framework, the VHL is the actual construction of a common space for the LA&C health scientific and technical information producers, intermediaries and users, jointly operating networked information sources. In the near future, it is expected that the common space becomes the base of the LA&C health sciences knowledge as registered in electronic format across the countries, and operated on the Internet in a compatible way with international initiatives.

The VHL cooperative model shifted the focus from the networking of ailed information centres to the networking of information sources. The construction of the VHL promotes and articulates the remodeling of the information flow in LA&C. Its purpose is to radically minimize the restrictions of the information flow, and therefore improving the democratic access to health-related scientific knowledge. The space being developed by VHL will contribute to set up the continuum of the information flow involving producers, intermediaries and users. It will leverage the participation of all players in the information flow. The information centres, positioning themselves as active players in the remodeling movement, will strength from the very beginning the provision of universal access to the different user communities, especially those non-connected to the Internet.

VHL operates on the Internet as a space with its own identity. It distinguishes itself from the whole network of Internet information sources as it follows quality control criteria, common methodologies and strategies to facilitate and improve interoperability. As a cooperative framework, VHL maximizes the application of limited available resources on the visibility and accessibility of the information sources, and minimizes the dispersion and inconsistencies of information sources, as well as the duplication of activities, products and services. VHL stimulates the formation of synergies and resonances in its space of dynamic information sources.

VHL is a natural progress of the LA&C technical cooperation in health science information. However, moving the focus from the network of ailed information centres to an integrated network of information sources implies the adoption of a new modus operandi, which encompasses sound advancements and changes in all aspects of the information flow, including politics, policies, planning, management and operation. In particular, information

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centres are challenged to operate electronic information sources on the Internet closer and closer to information producers, intermediaries and users. Of course, there is no way to avoid these challenges since overcoming them means to attain the very essence of the VHL as remodeling force. VHL also encompasses solutions and strategies to ease information centres along with other players to move to the new *modus operandi*. These solutions and strategies includes a detailed architecture to network information sources, planning guidelines, future scenarios, and coordinating instances to facilitate the cooperation and convergence of players, instances and events.

### **3.1. The VHL architecture of information sources**

The VHL architecture to network information sources was designed to ease the understanding, adoption and mastering of the new *modus operandi*. It provides solutions for the operation of decentralized information sources on the Internet, envisaging and fostering their immediate or future convergence and interoperability. At the same time, the VHL architecture demands and promotes the progressive convergence of players, instances and events. Within the VHL architecture, an information source is defined as any information resource, product or service, as well as any individual or community of individuals that fulfils user needs.

The VHL architecture is structured around six types of information sources, whose classification and scope are intended to decentralize the operation, combining the activities of different producers, intermediaries and users. The six types are:

a. Indexes, catalogues, directories, and referential, factual and numerical databases

This type of information source includes referential indexes and catalogues of scientific and technical literature, directories of institutions, specialists, projects and events related to health research, education and services, and factual and numerical databases.

The priority here is the systematic control of the scientific and technical literature produced in LA&C through the LILACS database system, which covers different scopes, such as geographic, thematic and institutional. The regional LILACS database is the principal index for the LA&C scientific and technical literature. A subset of 46 journals, from a total of 500 indexed in LILACS, is also included in MEDLINE. International literature is accessed via MEDLINE and other databases. The VHL indexes and referential databases provide links to the original document, be it in paper or in electronic format.

The directories serve to locate and tabulate data on the players, instances and events related to the health information flow. In addition, they will be progressively used as hypertext nodes within VHL.

Factual databases describe chemical substances, materials, technologies, etc. Numerical databases provide access to the series of raw data, macrodata, indicators, and tables.

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Some of these databases are already available in the VHL, as others are being moved from a variety of supports and platforms. In most cases, this realignment process is the starting point in the adoption of the VHL.

b. Electronic publications

Electronic publications include the operation of and the access to national and international collections of full texts in the health field.

LA&C electronic publications will be operated at national and institutional levels. Scientific journals will be progressively published online through the SciELO Model for the preparation, storage, publication, preservation and evaluation of scientific electronic journals. The priority here is to develop national SciELO Sites publishing collections of leading national journals, as well as regional SciELO Sites covering thematic areas. The SciELO Model was developed by FAPESP, the Foundation for the Promotion of Science of the São Paulo State, and BIREME. SciELO Model can be applied to all scientific subject areas. Presently, it is being adapted to manage other types of literature, such as monographs, proceedings of congresses, theses, governmental documents, legislation, etc. Therefore, it will be used to network all relevant documentation produced by health-related institutions.

It is expected that the access to international scientific publications, especially scientific journals, will increase in the near future with the emergence of public domain collections of journals and articles, following the initiatives led by renowned international institutions such as the US National Institute of Health, European Molecular Biology Organization, British Medical Publishing Group, etc. It is expected that the open archive initiative will contribute to increase the accessibility of decentralized publications by providing common retrieval interfaces and protocols. Meanwhile, the access to commercialized scientific journals should be done through consortia, in order to increase the number of information sources available, as well as the number of readers.

c. Information sources for education and decision making

This category includes a wide spectrum of information sources of didactic nature and/or oriented to decision-making processes in health-related matters.

In support of education in health sciences, VHL considers the development and operation of collections of electronic texts and multimedia with free access on the Internet and/or on Intranets of educational institutions. These collections are oriented to both traditional educational settings and distance learning formats through Internet. It is expected that VHL will become the place of excellence for producers, intermediaries and users of educational support material. VHL will also contribute to evaluation processes of different systems, methodologies, products and services applied to distance education.

With reference to the development and operation of information sources to support health-related decision making, VHL intends to cover different contexts, situations and respective user communities, such as authorities, managers, scientists, professors, health professionals, and the public in general. Examples of information sources are numerical indicators, manuals, guidelines and evidence based recommendations addressed to professionals and the general

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public, case studies, reports of positive and negative experiences, collections of answers to frequent asked questions covering specific subjects, interviews with specialists, etc.

d. selective dissemination of information

Selective dissemination of information is a VHL service aimed at alerting subscribers on new sources of information included in and/or referenced by the VHL, according to predetermined profiles. The service will become more important as the available volume of information increases. On the other hand, information sources will be more visible and accessible as they become integrated in and/or referenced by VHL.

VHL will develop a network of profiles, which are expected to be improved as they are used. User subscriptions, as well as requests for new profiles will be processed online. Alerts will be sent to users via Internet services such as e-mail, web or PUSH.

SDI services should be used by information centres or other intermediary agents to meet user communities needs that are not connected to the Internet.

e. communication within VHL

A fundamental characteristic of the Internet paradigm is the provision of intensive and fast communication among people, allowing the development of virtual communities centered on specific matters or interests.

Within VHL, communication encompasses information sources that promote and establish direct and indirect communication among users, including news, discussion lists, interest lists, teleconferences, online interviews, forums, etc.

f. VHL integrating components

The VHL space is integrated through three common mechanisms: controlled vocabulary, catalogue of decentralized resources, and methodologies.

The VHL controlled vocabulary, DeCS – Descriptors in Health Sciences, is operated in a three-language database – Spanish, Portuguese, and English. DeCS terminology and structure is based on MeSH (Medical Subject Headings) from the US National Library of Medicine (NLM). The Spanish and Portuguese terms are included in the Unified Medical Language System – UMLS of the NLM. DeCS contains over 25,000 entries, including terms from MeSH and terms included by BIREME to describe/retrieve information sources in public health and homeopathy. The public health area contains over 6,000 terms and covers specific areas, such as health service administration and health sector reform, environmental sciences with sanitation engineering, natural disasters or disasters caused by mankind, etc. The DeCS vocabulary is constantly updated with the contribution of a network of institutions and specialists.

Catalogues of referential VHL internal and outside information are operated via the Health Information Locator, which allows the description and retrieval of information sources according to international standards. VHL will operate national and international catalogues.

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The third VHL integrating component is composed by common methodologies to be used by producers and intermediaries to operate VHL information sources. The methodologies include guidelines, standards, manuals, software, etc. The use of common methodologies maximizes the connection among information sources, facilitating hyper-links, navigation, evaluation, etc. It also facilitates the training of human resources, and contributes to reduce tool costs. VHL has a series of public domain methodologies to operate the diverse information sources. This area needs constant development since construction and operation of the VHL continuously require preparation of new methodologies and improvement of existing ones. The producer, intermediary and user institutions are responsible for contributing to the development of the VHL collection of common methodologies.

### **3.2. Implementing the VHL: principles, scenarios, planning and coordination**

The VHL development and operation are guided by a series of orientations and principles:

- (a) Equity is the governing principle in the development and operation of the VHL, which aim is to guarantee that health sciences information related institutions and communities have the right to participate, including all geographic and subject areas.
- (b) Priority should be given to policies and actions towards the establishment of partnerships and alliances among all players, envisaging the joint operation of information sources.
- (c) The cooperative development of the VHL should be decentralized envisaging the capacity building at all levels.
- (d) The VHL development and operation should depart from local conditions in order to guarantee active participation and sustainability.
- (e) Information sources should operate under integrated mechanisms of quality control and evaluation.

Furthermore, the VHL implementation follows two main axes. The first refers to the main scenarios to be developed during the next five years, and the second refers to the contexts of development around geographic and subject areas.

The VHL implementation foresees three scenarios for the next five years:

- In the current period, between 1999 and 2001, the scenario is called "setting up the VHL". Basically, it implies the adoption of the VHL modus operandi, and the coordination of actions among producers, intermediaries and users in order to start the cooperative operation of information sources. Priority is given on moving or realigning current products and services to operate in the VHL context. Implementing the VHL is a priority and it occurs simultaneously in geographic and subject areas. During this period, promotion and training activities characterize the technical the cooperation activities.
- Between 2001 and 2003, the scenario is called "the VHL builds momentum". Its main characteristic is the strengthening and the dynamic expansion of decentralized nodes of

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information sources and the emergence of the VHL virtual space. A significant increase in the number of new institutions and/or information sources operating in the VHL should occur, both in geographic and subject areas. During this period, the activities towards the emergence of independent initiatives characterize technical cooperation.

- Finally, from 2004 on, it is expected that the VHL scenario will become the (auto) reference for health scientific and technical information through LA&C. During this period, cooperation in scientific and technical information acquires its own dynamics.

The second axis refers to the geographic and subject contexts where the VHL is actually implemented:

- Geographically, the implementation foresees and requires the active participation of all countries operating their own information sources in the VHL. In this context, technical cooperation is oriented to the development of national capability, including the generation of more advanced and efficient coordination and organization formats to enable the active participation of producers, intermediaries and users. In this sense, an important aspect of technical cooperation consists in establishing and operating national Consulting Committees to coordinate national participation in the VHL, as well as the preparation, implementation and follow-up of national plans for VHL implementation. In order to utilize synergetic power among groups of countries, technical cooperation projects and programs should be implemented.
- Regarding subject areas, the implementation of the VHL departs from the potentials, strengths, capabilities, resources and initiatives that characterize information flow structures within health specific subjects that favor the creation, development and operation of specialized health information networks. PAHO Regional Programs and specialized Centres have a fundamental role in promoting, implementing and operating subject areas in the VHL, at regional and sub-regional levels. Nationally, the development of specialized areas within the VHL should include active participation of governmental institutions, especially health promotion programs, research centres, professional and scientific societies, scientific editors and publishers associations, non-governmental, public and private organizations, etc.

In the VHL, the development of geographical and subject areas is complementary. In both cases, VHL implementation should be guided by plans, especially for the setting up period.

The VHL planning, development and follow-up at national level or by subject areas should be advised by Consulting or Advisory Committees. The concurrence of active Consulting Committees representing the principal institutions related to health information flow in the context of a country, group of countries or a subject area is essential for the efficient and sustainable development of the VHL.

The main role of the Consulting Committee is to establish and improve a cooperative instance to assure active and equal participation of all institutions interested in constructing the VHL. Furthermore, the Committee establishes priorities, guidelines, strategies and criteria for the VHL operation, according to national or subject area priorities and conditions. The Consulting Committee represents the VHL.

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The Consulting Committee is responsible for the VHL implementing plan in its context, including its preparation, discussion, funding, implementation, follow-up and evaluation. Plans are based on specific projects oriented to the operation of information sources according to the VHL architecture. Specific projects facilitate the decentralized operation, as well as the establishment of partnerships following player priorities and expertises. In addition to the operation of information sources, plans should include specific projects on training, envisaging capacity building of producers, intermediaries and users, and on marketing, envisaging the wide dissemination of the VHL.

### **3.3. The VHL by June 2000: advances and challenges**

Since its launching in March 1998, VHL has been disseminating throughout the countries of the Region in meetings and/or via advertising materials and actions. More than 100 meetings were already conduct, and thousands of leaflets were distributed to promote and discuss VHL as the strategy for the remodeling of the health sciences information flow structure in the Region. This dissemination aims at getting the support from health authorities, managers and professionals towards the adoption of the VHL paradigm as national policies.

VHL has also been disseminating worldwide envisaging getting support from international organizations. VHL is also a privileged space for the convergence of international cooperation. This dissemination was primarily done inside PAHO and WHO, expecting that the complete adoption of the VHL model for LA&C will occur during the next three to four years. It is also expected that other international organizations will orient their information activities via the VHL.

The actual adoption of the VHL has been a challenging process. It is usually very well accepted mainly because it clearly shows a way to the future, following international trends on the remodeling of information flow. However, it implies radical changes in the modus operandi of the information centres and other instances of the information flow. As a consequence of the natural resistance and difficulties related to the acceptance of new paradigms, the actual adoption of the remodeling process takes time. Preliminary experiences indicate that the adoption process takes at least one year. The key advance is the progressive operation of information sources on the Internet together with other players. In most cases, in addition to the political and managerial decision making process, the adoption of the VHL requires the training of human resources at managerial and technical level and the change of the organization structures and functions related to the information flow. These are the main areas that demand technical cooperation since 1998, and we expect it will continue during the next two years until the VHL acquires momentum in most of the countries.

The development of models and experiences is the central strategy BIREME is using to overcome the challenges in the adoption of the VHL. The models and experiences take place at both national and thematic contexts, and are publicized and discussed in regional and national meetings. Other positive force is the fact that the remodeling of the information flow is an international and universal movement, which reduces the resistance of the more conservative players and instances and makes the adoption of the VHL more secure.

At the end of 1999, BIREME organized the 1<sup>st</sup> VHL Regional Coordinating Meeting, which took place in PAHO headquarters. This meeting represented a breakthrough in the development of

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the VHL. More than 120 representatives of Latin American and Caribbean national and regional institutions related to health scientific and technical information were present. It was the first time the institutions that approved the VHL in March 1998 met again. The change was very impressive. During three days the presentations and discussions centered on the advances and difficulties related to the actual adoption of the VHL. BIREME presented a document entitled Guide 1999 for the Development of the VHL, describing in depth the VHL framework, as well as offering orientations for its development.

The 1<sup>st</sup> VHL Regional Coordinating Meeting showed that VHL is an irreversible reality as the technical cooperation framework for health information. In addition to the presentation of models and experiences, the meeting main achievement was the discussion on the means to promote the wide convergence of the information flow players in the building of the VHL. The meeting most important conclusion was the recommendation for the adoption of Advisory Committees to be integrated by health-related information producers, intermediaries and users as the coordinating and promoting instance of the VHL at both national and thematic areas. Other major achievement of the meeting was the demonstration that VHL may be adopted by countries with different levels of development and availability of technological infrastructure. This condition opens the possibility to rapidly advance in making information available to all.

By the end of June 2000, the development of the VHL can be summarized as the following advances and challenges:

- a. VHL was disseminated in most of the LA&C countries. It is well known by the health-related information centres community, but it still lacks the necessary dissemination throughout health and scientific information authorities in order to be adopted as a national information policy. This is the major challenge to be faced in the next year regarding dissemination.
- b. 15 countries formally adopted VHL. Preliminary actions are being developed under the new model. Most of them have already established National Advisory Committees, as well as national plans for the VHL or are in process of doing so. As stated before, this is a process that requires time and faces natural resistance including the support of authorities and the lack of human and technological resources. The main practical activities that characterize this first step are the moving of the traditional health-related information products and services to the VHL context, including bibliographical databases and services for accessing original documents. This realignment process is important because it establishes a necessary link with the past operation, and facilitates the transition to the VHL. In particular, the bibliographical control of the LA&C health-related production is being operated in the VHL.
- c. VHL is being implemented in selected thematic areas as models to be further duplicated. Thematic areas have specific advantages to adopt the VHL due to the fact that it is easier to identify the communities of producers, intermediaries and users, and its development can be integrated at national and regional level. Other key factor is the natural confluence of the VHL with the information related activities of PAHO specialized programs and regional centres. Two thematic areas – adolescence and toxicology – are being developed as models. Adolescence was selected because the young people are the social segment that makes intensive use of Internet or is open to do so. Therefore, they are a consistent public to interact with the VHL network of information sources, demanding a high degree of

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contextualization. With adolescence we also have a context that facilitates the convergence of the information flow players, instances and events, involving authorities, professionals and users towards the VHL common space. In addition, adolescence needs to be developed at local level to incorporate adolescence language and idiosyncrasies. Adolescence is now being developed in Brazil, Costa Rica and Mexico, and also at regional level. Toxicology was selected because it is a thematic area that has a great variety of information sources, a well-defined user community and a wide range of information demand. It is being implemented under the leadership of CEPIS at regional level. Based on the adolescence and toxicology models, several other thematic areas have started the implementation of the VHL.

- d. Electronic publishing is a key component in the VHL architecture, and it is a priority for its development in the near future. It is expected that in no more than 3 years VHL will operate in a decentralized and integrated way the most relevant scientific and technical literature in electronic full texts. This is of course a big challenge because it implies a high degree of advances in the technological area and also the cooperation of different players. The SciELO model for scientific journals is being applied at national and regional levels with a high degree of success. At national level, the strategy is to work together national science councils involving all scientific areas. Four countries are operating the SciELO model – Brazil, Chile, Costa Rica and Cuba. Several others are working towards the adoption of the model. At regional level, SciELO is being applied to operate a collection of four of the best public health journals oriented to Latin America and one of Spain. The SciELO model for scientific journals represents a breakthrough in the scientific communication in LA&C because it addresses all its components to increase visibility, accessibility and impact. The SciELO model is being adapted to be applied in the near future for other types of literature, such as governmental documents, theses, proceedings of congresses, legislation, etc.
- e. A crucial issue in the development of the VHL is the promotion of the convergence of players, instances and events related to the health information flow. Although this is an international trend, its development in LA&C is a major challenge. The strategy to strengthen this convergence process is being applied through three lines of action. First, the establishment of National Advisory Committees to coordinate and promote the participation of each country in the VHL, involving the main national institutions related with health information, such as institutions from the Ministries of Health, Science and Technology, and Education, as well as scientific and professional associations, with the participation of PAHO and other international organizations. The establishment of National Advisory Committees is a condition for the equitable development of the VHL. Second, the development of thematic areas in the VHL at national and regional levels implies the establishment of Advisory Committees involving also the main players of specific areas. Through the combination of the activities of National and Specialized Advisory Committees the VHL convergence will be dynamic. Third, the development of major projects involving different dimensions of the information flow that applies to all countries and to all subject areas. It is included here the bibliographical control of the LA&C scientific and technical literature through the LILACS databases, the SciELO Model for electronic publishing, and the DECIDES initiative to democratize the scientific research agenda and the access to scientific information.

The most important characteristic of the adoption and development of the VHL in LA&C are its sustainability. The VHL departs from local conditions and from the existent scientific and

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technical information infrastructure. As a matter of fact, most of the advances already achieved rely on currently available financial, human and technological resources. The operational players – information producers and intermediaries – are succeeding in the adoption and operation of the VHL. A more accelerated and deep development in the near future will require much more political support and financial resources.

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