

George A. O. Alleyne
Director, PAHO*
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HEALTH SCIENCES INFORMATION: PROMISES AND PRACTICES **
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Mr. Chairman, ladies and gentlemen, let me also welcome you to this Third Regional Congress on Health Sciences Information and I must thank the Ministry and Minister of Health of Brazil, Dr. Jatene, as well as the Oswaldo Cruz Foundation and its President, Dr. Morel for their support. I note that the theme of the Congress is the Crossroads of Information Technology: The Future Link. It is clear from the titles of the presentations and lectures that your discipline believes that there is a very bright and exciting future ahead, if only the correct road is taken. In my comments, I will try to mix the personal and institutional perspective on a theme that continues to fascinate our Organization, as we are convinced that the only arm of the crossroads one can take is that which leads forward. This is because we believe that the information future as well as the future of information technology is bright.

One is never sure why one selects a particular title for a presentation. One very common approach is to try to make the title provocative so people will be attracted to come and listen. Another approach is to make it so all encompassing that one can discuss any number of topics under a general rubric. I thought I had selected this title in the former mode and was going to deal almost exclusively with the policies of the Pan American Health Organization (PAHO) with respect to the management of health sciences information. But as I began to develop it, I found this focus far too narrow and I needed to give some context and texture to how I perceive the promises and the practices involved in health sciences information. Promises refer to the future and practices to the present, but I found that I had to include my own personal reflections born of my years as a practicing biomedical scientist — a producer and user of health sciences information — and try to weave some threads between them and my present position, in which I am concerned primarily with the public's health — and even more specifically with the health of the public of the Americas.

I had to reflect on the changes that have taken place since I began my career and can make common cause with the words of the British sociologist Barbara Ward who spoke of the imbalance between the biosphere of man's inheritance and the technosphere of his creation. She said some 20 odd years ago in a famous statement — *This is the hinge of history at which we stand. The door of the future opening onto a crisis more sudden, more global, more inescapable than any ever encountered by the human species.*

* **Pan American Health Organization, Pan American Sanitary Bureau, Regional Office for the Americas of the World Health Organization.**

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And although the Armageddon she was fearing did not take place, major changes have occurred and most of us barely notice them, because we are in the middle and preoccupied with survival. The changes in medicine, its future and the potential for intervention are enormous but they must be seen in the context of other changes, particularly in our thinking. These changes — these major transitions of our time are all having a profound impact on our health and one can always detect the hand of scientific information facilitating, enhancing, promoting and explaining them and perhaps lubricating that hinge of history.

Perhaps the most astounding of these changes is in our perception of the importance of the environment. The knowledge of the relationship of the environment to health is as old as the hills, but it is only relatively recently that we have woken up to the dilemma as to how much of our environmental future are we prepared to mortgage to satisfy our current wants or needs. It is only recently that we have internalized the fact that the elements of our environment are finite and there is not an infinite and inexhaustible capacity for absorption or regeneration. It is only recently that we are appreciating the real magnitude of the possible ecological changes caused by man's actions and the effect, actual and potential on man's health. The appreciation of these changes at a scientific and popular level is due to the genesis, dissemination and popularization of the relevant scientific information.

The most significant of the changes, for me personally, has been the reevaluation of the rationality of the scientific method of Bacon and Descartes as the approach to producing scientific information and knowledge. This was important for two reasons. First, there was the appreciation of the insufficiency of the inductive generalization as a result of empirical observation. And then I grew to appreciate Popper's approach of deduction of testable theses that came from new or established theory. In other words, the power of falsification of theories became more apparent. But perhaps the other and more important reason, in the context of our current discussion, is that we now can appreciate the true interconnectedness of systems. The major problems of the universe, and I dare say the vast majority, if not all of the important problems of health are derived from interrelated and interconnected determinants.

You may be surprised to hear me say that the third of the great changes I have observed is what Capra calls *the reluctant but inevitable decline of patriarchy*. It is no longer a man's world and the appreciation of what is referred to as the *yin* values, and the increasing realization of the importance of gender as a class of social analysis has changed much of what we thought we knew about health, and demonstrated the relative paucity of health sciences information that bear on this issue.

It is obvious that these and other changes you may wish to add would never have succeeded in shifting any decisions of a policy or strategic nature without the spread of scientific information. The data have grown steadily and their analysis and transmutation into information have been the mechanisms for initiating change.

These more global changes I mentioned have had their echo in our appreciation of health. I referred to the environment and its known relationship to health. But it is the shift from reductionism to systemic thinking that has had the major impact on how we see health. The relation of health to social conditions has been known for at least a century and the major advances in public health, at the beginning of this century, were the result of sanitary engineering. The appearance of the germ theory of disease and the applications of bacteriology followed, and in many places were amplified by the focus on personal hygiene and having physicians alone or in institutions accept more and more responsibility for health.

But the consistent search for an explanatory systemic model for health perhaps approached an end with basic conceptual work by Canadian scientists. In essence, the results of their analysis have led us to accept that it is the social and physical ecology that have the major role to play in determining health, while health services and genetic make up play relatively minor roles. All of these determinants interact with one another and in the same way the interventions necessary to protect or promote health are rarely single. But brilliant though these concepts were in explaining health as a state of well-being, we have never lost sight of the need to be concerned about the cure of and rehabilitation from illness. Thus, today our fascination with, and our need for health sciences information is related to our need to relate our health to the major changes taking place, to know more about the determinants of our health and to be aware of the methods available for restoring it.

What is the promise of health sciences information in responding to these needs?

We are all currently fascinated by the possibilities of information in general, and much of this is driven by three basic factors. First, there is the technology and the approximation of communications and computers. You are all aware of the tremendous advances in data processing. At the recently concluded Conference of the G-7 Ministers on the Information Society, the Chairman in describing a shared vision of human enrichment said:

Progress in information technologies and communication is changing the way we live: how we work and do business, how we educate our children, study and do research, train ourselves, and how we are entertained. The information society is not only affecting the way people interact, but it is also requiring the traditional organizational structures to be more flexible, more participatory and more decentralized. A new revolution is carrying mankind forward into the information age.

That meeting stressed that the information society should be devoted to the people, and universal service should be promoted to ensure opportunities for all to participate. In the approach towards improving the understanding of those phenomena that affect the quality of

life, projects and joint actions were to be developed to show improvements in health care, educative leisure, urban development and greater participation of the disabled in society.

Much of the focus, however, of that important meeting was on information for enhancing economic opportunity, and the Ministers developed some core principles they saw as guiding us into this new age. These included fair competition, private investment, and an adaptable regulatory framework with open access to networks. There should be universal provisions of and access to services, equality of opportunity, diversity of content and incorporation of developing countries. The vision of the global infrastructure is one of a network of networks.

In this same initiative a project on a universal library was discussed. This *Biblioteca Universalis* is to constitute from existing programs the large, distributed virtual collection of humankind knowledge, made available to a large public via networks, and to advance international cooperation towards the establishment of global electronic library systems. This would be the prototypical library of the future that would be digital and would revolutionize our education methodology and our access to our varied cultural heritages. The only limitation on use would be level of interest and curiosity.

The other two trends that will, of course, influence the information revolution are the reduction in costs of moving information and the popularization of the technological changes. These two are linked in that with increased popularization costs will of necessity fall.

Thus, if one might translate this from information generally to health sciences information specifically, the promise is one of a world in which there is unlimited access to such information by all who possess the technology. There would be no health or disease problem anywhere which could not have the collected information of the world brought to bear upon it, and hopefully solve it. On another occasion, I have spoken of the possibility that this vast amount of information with ready accessibility would create a genuine democracy of health. We would have individuals with access to intelligent computer doctors, taking care at home of the many simple problems that are now treated in the formal health care system, with obvious reduction in costs. Health sciences information would no longer be only for scientists but for everyone.

Much of the enthusiasm for this new world of ready access to health and health science information is driven by the possibility of improving health care and reducing health care costs. There are visions of computerized hospitals, robotic surgery — virtual doctors offices and perhaps even virtual doctors — and telemedicine holds out the promise of making all images that deal with diagnosis transportable to anywhere in the globe. In the style of Dick Tracy, individuals may have a *health watch* to monitor continuously their various functions and transmit the data to the computer doctor that will diagnose and treat instantly.

But let us come down a bit from these heady thoughts of an information Nirvana and discuss the practices involved in health sciences information more specifically as they relate to the Americas and PAHO's technical cooperation.

The Pan American Health Organization had its origin as an office responsible for collecting and disseminating health information and to a great extent has never lost its pristine remit. We see health information as a critical tool for allowing us to see our vision realized and to accomplish our mission. The central pieces of our vision are that there should be equity in health and that the panamerican approach should be fundamental to our work. Our mission turns around our capacity to cooperate technically with our Member States and stimulate cooperation among them.

Our work in promoting and searching for equity was highlighted in my recent annual report as Director. This equity that we seek has a moral or ethical connotation and implies the elimination of differences or inequalities that are unfair and unjust. As a first approximation we translate it as regards services, into equality of access, equality of utilization and equality of outcome. Fundamental to our efforts in this area is the collection of reliable data and transforming them into information that permits clear definition of where the inequities exist. Inequity does not only exist among nations and groups but among people, and social inequity is demonstrated most clearly in health outcomes. The availability of information is crucial not only to demonstrate the inequalities but also to correct them. At the individual care level, it is sometimes not the unavailability of material resources, but informational resources that make the difference between one or other outcome.

Dissemination of information is one of the fundamental aspects of our technical cooperation and perhaps the part of most interest to you. PAHO disseminates information that it collects and/or produces. You will probably hear during the Congress of the extensive list of publications in which we take some pride. During the course of last year we established 56 publication centers in nine countries and we have pursued an aggressive policy of marketing our publications. We have, of course, made use of the Internet and have widened our reach by using not only a text based gopher service but have initiated a World Wide Web service that allows access to a wealth of information about PAHO. In order to facilitate translation, PAHO has developed and trademarked machine translation and licence agreements have been signed with various governments for its use.

Our journals, bulletins and books tell what we produce in the way of health science information, but as a part of our technical cooperation we are concerned with the production and availability of information by and for others. The classical role of the library and health science information specialist has been more along these lines of making information available.

In this regards, I need not remind anyone here of the work of the Latin American and Caribbean Center on Health Sciences Information (BIREME), which has grown from a more

traditional library to being the main organizer of networks of centers involved in providing health science information throughout Latin America and the Caribbean. I have continued to support BIREME in its development and maintenance of a LILACS database. This methodology provides a framework for standards and tools to facilitate the entry and retrieval of literature from Latin America and the Caribbean. BIREME, like the rest of PAHO, is deeply interested in the production of health science literature in our Region and we are very aware of the dominance of the larger and richer countries such as Brazil, Argentina, Mexico, Chile and Venezuela in scientific production. There are now several studies of the quantity and quality of production in the Region and the paucity of literature dealing with population health.

Perhaps of equal concern to us all is the access by journals from Latin America and the Caribbean to the elite databases of the world. A recent article in *Scientific American*, chronicles the troubles of a Latin American Journal in seeking access to Science Citation Index (SCI) and bemoans the fact that *the invisibility to which mainstream science publishing condemns most Third World research thwarts the effects of poor countries to strengthen their indigenous science journals*. The implications of this are enormous for us and for the world. Not only does this attitude frustrate Third World scientists, but it also deprives the world as a whole of having access to health science that may be of more than parochial interest. I was intrigued to review the lecture given to this Congress two years ago by the doyen of health science information specialists, Eugene Garfield, on publication and national research policies. One might interpret his presentation as a remedy for the problem mentioned above. He suggested *inter alia*, recognizing and favoring the elite who do produce good work, fostering north-south collaboration, formation of regional journals and making a special effort to use and train students to use the most advanced technology for information management.

PAHO's support for BIREME as a regional resource is also based on my perception that, given the difficulties mentioned above, there must be some mechanism for our scientists to access our literature through databases that are also accessible to the wider world. The creation of the Regional network and the facility of access to regional health science information is important for other reasons. I have begun to understand the possibility of having large numbers of our scientists accessing large central databases through the Internet, without necessarily having to go through regional centers. This appears at first sight to be a major advance, with the end result being a true globalization of health science information.

I hope I am not being unduly cautious when I suggest that we be wary of a headlong rush towards globalization in this context. I am very sensitive to the recent concerns expressed by various leaders from the Third World who see the economic aspects of the globalization process resulting in greater polarization and inequity, with wealth being concentrated in a few hands in the developed countries and marginalization of the already poor. There are numerous examples of this polarization and according to the latest Human Development Report, in recent years the poorest 20 percent of the world's people have seen their share of global income decline by about 30 percent, while the share of the rich increased.

I believe that in the long run we can have globalization with increasing economic growth and increased equity. There are good data to show that equity and growth are not mutually exclusive. However, for this to occur there has to be a definitive policy such that there is a serious and deliberate attempt at distributive justice. I would follow a similar line of argument for health sciences information and posit that there can be globalization without information inequity, but for this to happen we must preserve and strengthen the regional networks and insist on the quality of the material we enter into our database as well as its technical excellence.

This will be PAHO's and BIREME's orientation for the future. We see enhanced service to new generations of users and the provision of services to cater to new demands. We see emphasis being placed on the development of the human resources needed for the new health science information centers that will concentrate on the collection, storage, retrieval and dissemination of information. But in addition, we will try to avoid the trap of promoting the handling of information as an end in itself. One of the challenges for our practice is to span a wide range of health sciences information needs. On the one hand, we would wish to see the networks providing access to information that will allow scientists to know the various theories that are being proposed and thus, in a Popperian sense, be able to design their work to test and perhaps falsify them. We would also wish to stimulate through dissemination of information the accumulation of knowledge and the building of contrary evidence that is necessary for the paradigmatic shifts that are essential for the growth of any scientific culture. On the other hand, we must and can never ignore the need to provide health science information for its more banal but highly pragmatic application for the solution of the individual and collective health problems of the people of our Region. We would aim to provide technical cooperation such that the appropriate health science information is available at the right time and at the right place, to facilitate the right decision. We must, therefore, envisage serving a wide variety of users that range from institutions to individuals involved in the various activities that contribute to enhancing our knowledge of health or restoring that health when it has been disturbed. Our structure, our mandates and our people put us in a good position to do this and with your help we will certainly try.

We see this area as one that will contribute to the realization of the other part of my vision for PAHO — panamericanism — as the strength of network depends on the willingness of the centers from and within countries to work and share together.

I trust your Congress will go well, and by well I do not mean that it will be tranquil or that there will not be battles of ideas that play themselves out in fierce argument, for as Milton wrote:

Where there is much desire to learn, there of necessity will be much arguing, much writing, many opinions, for opinion in good men is but knowledge in the making.

And we know that this acquisition of knowledge is the precursor to the wisdom we need to make the right choices.

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