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INFORMATION – A BRIDGE OVER THE DIVIDE
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It is three years since we met in San Jose, Costa Rica at the Fourth Pan American Congress on Health Sciences Information, and I have had many opportunities to reflect on the meaning of the Declaration you made there and its relevance to the Pan American Health Organization (PAHO). I have kept coming back to the opening lines of that Declaration. You said inter alia:

“That health and well-being are the foundation and reason for all efforts channeled towards development; that health conditions are intimately related to the equity of living conditions and access to the fruits of development; and that access to information constitutes one of the essential elements to achieve these goals.”

On those bases you pledged to construct the Virtual Health Library—a form of interaction that took your cooperation in the dissemination of scientific and technical information in health to another level that was made possible in part by the spectacular growth and promise of the Internet.¹ This was yet another field of application in which the Internet would give promise of a better world.

This internet, this remarkable phenomenon of our time has been made possible by the confluence of the powers of communication and computation. The concept and practice of communication are as old as mankind, but not so with computation. I wonder what Charles Babbage would have thought if he had been with you in San José. That acknowledged father of modern computers who conceived a calculating machine in 1822 never saw the fruits of his genius, and in a moment of frustration later in his life wrote as follows:²

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

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¹ **Virtual Health Library**. Eds. Abel L. Packer and Elenice de Castro. PAHO/WHO 1998, Latin American and Caribbean Center on Health Information, BIREME, Sao Paulo.

² **The Misanthrope: Quotations**. <http://ei.cs.vt.edu/~history/Babbage.2.html>

--If unwarned by my example, any man shall undertake and shall succeed in really constructing an engine ...upon difference principles or by simpler means, I have no fear of leaving my reputation in his charge, for he alone will be fully able to appreciate the nature of my efforts and the value of their results.

His wildest dreams have been realized, as many have been unwarned by his example and every one of you knows how these engines have transformed our lives in ways that most of us still do not comprehend. These descendants of Babbage's difference engines no longer serve only to calculate astronomical tables but they find their ways into our very bodies. They are the means for the collection and the codification of all those data that you beat and shape into useful forms.

It is those forms, that information, that lead to knowledge which causes change and it has always been the hope of all of us here, and the millions who are not here, that the change would go towards reducing those inequalities in health that we believe to be unjust and we call inequities. I will not discuss this with you on this occasion, as three years ago I called your attention to that search for equity that is the bedrock of the call for Health For All. That call still represents one of the most challenging, moral affirmations of our time and nothing has occurred to diminish its luster or to deviate us from its central purpose.

I cannot help reflecting on the relevance of knowledge for change, which is the basic theme for this Congress, and how that knowledge is produced and used. I have been lead to believe that change in human affairs occurs when persons internalize knowledge that acquires meaning, and is conducive to the development of the wisdom that allows the choice to be made as to whether we pay the price of moving from the current state to another. So it is today, and so it has been for all the great social and political revolutions that have shaped our world. All major historic transformations result from the actions of persons individually or in the various groupings of increasing complexity that make up society, and the detonator for change is always information leading to knowledge formation. Thus, change in a very fundamental way implies as a prerequisite the capacity to bridge the "knowledge divide." I will deal with other divides and the role of information in bridging them, but first I wish to discuss the role of information in bridging the knowledge divide, and the mechanism by which information ensures that knowledge is indeed created and used for change.

The argument for the importance of the knowledge divide is made very cogently in relation to the economic development of countries and is spelled out in the 1998-1999 World Development Report from the World Bank entitled "Knowledge for Development."³ This shows estimates that more than half of the GDP of the OECD countries is based on the production and distribution of knowledge. This is but an affirmation of the claim made by the management guru, Peter Drucker, that we are now in a knowledge-based economy. Almost 40 years ago Drucker wrote:⁴

³ World Development Report. Knowledge for Development Published for the World Bank – Oxford University Press 1998-1999.

⁴ Drucker P. F. The effective executive, Pan Books, 1967.

...up to recent times, the major problem of organization was efficiency in the performance of the manual worker who did what he had been told to do. Knowledge workers were not predominant in organization....[Now] the knowledge worker is the one 'factor of production' through which the highly developed societies and economies of today become and remain competitive.

Examination of the differences in capital accumulation between some countries cannot be attributed solely to differences in the accumulation of physical and human capital, and many of the theories of economic growth of countries now include some estimate to account for the accumulation of knowledge and the diffusion of information to produce new knowledge. The difference between the growth of many developing countries and the more developed ones can be said to represent a knowledge divide. While the concern for this has often focussed on the creation of new knowledge, emphasis must also be placed on the manner in which information permeates societies to bridge the divide. This rapidity of permeation is in part due to the process of globalization, and also by the spread of large multinational corporations which, by their very nature, have to transfer information globally and create new knowledge where they function. The fundamental point to be made is that since, by definition, knowledge cannot be transferred, but be created in situ through previously acquired information, then it is information that enables persons and countries to bridge the knowledge divide.

The World Bank has been so convinced of the importance of information in bridging the knowledge divide that it has created the program "infodev" which seeks to open doors to the information revolution.⁵ The thesis is that emerging economies need to prepare themselves to inculcate knowledge into their citizens as an essential ingredient for further economic growth. To the extent that responsible government is also critical for growth, and information can contribute to such a government, the World Bank is also trying to stimulate the formulation of what it calls an e-government toolkit.⁶ To quote from the announcement:

"e-government is the application of information and communications technology to transform the efficiency, effectiveness, transparency, and accountability of informational and transactional exchange within government...and to empower citizens through access to and use of information."

But it is not only in the sphere of economics that we see the importance of the knowledge divide and the use of information to bridge it. Preston and his colleagues in the World Bank developed a famous set of curves that tracked the relationship between wealth and life expectancy at various times in history.⁷ The impressive finding was that there was always a curvilinear relationship between wealth and health; the wealthier the

⁵ **Infodev, Information for Development – The World Bank Group.**
<http://www.infodev.org/about/backgrou.htm>

⁶ **E-Government toolkit for developing nations. The World Bank.**
http://www.infodev.org/news/rpf/infoDev_e-government_v2.htm

⁷ **Preston S. H., Keyfity N. & Schoen R., 1972, World Bank data, cited in World Development Report, Investing in Health Published for the World Bank, Oxford University Press, 1993.**

person, the greater the life expectancy. But another noticeable feature was that the curvilinear nature of the relationship was present and with similar form at different time periods. The important characteristic was that for a similar level of wealth, a person lived longer in 1990 than he or she would have done 90 years before. The difference was, in all probability, due to technological progress and the accumulation of knowledge.

Much of the relatively rapid decline of infant mortality in developing countries has to be due to the application of new knowledge, and there are some natural experiments in developed countries to show the impact of individual knowledge on the change in illness patterns. The knowledge divide between rich and poor people, as well as between rich and poor nations, is responsible for many of the differences in health status. The well-known relation between the schooling of girls and the infant mortality rates in countries is a clear manifestation of the impact of individual knowledge on a health outcome.

The idea that crossing the knowledge divide is the only factor that is crucial to the solution of many of the health problems of the world, comes under scrutiny in relation to both communicable and noncommunicable diseases. The case of HIV/AIDS is the most acute. For years we have had the knowledge about the cause of the disease, we know a great deal about how to prevent it, and there is good evidence that the knowledge level about cause and consequence is high in most populations. So in that sense there is no knowledge divide, and the efforts to disseminate available credible information have been good. Yet the epidemic continues and large numbers of persons with the information, and presumably the essential knowledge, continue to indulge in unsafe sex practices.

The argument has been put that codes of sexual behavior do not change with providing the kind of knowledge that is usually available in the individual. The theories of behavior change employed by social communicators and experts in marketing, have emphasized the aspect of pleasure, or conversely, the cost that is involved in making any change as a result of acquiring knowledge. In cases like those of persisting risky behavior, the answer must be that either the cost or the reward is not sufficient for the wisdom that results from knowledge to spark the appropriate change. Information has reduced the knowledge divide but this has not been enough to produce the desired change in behaviors that perhaps are grounded in those aspects of human nature that owe their origin to their epigenetic rules. These rules that govern a myriad of aspects of behavior, stretch back millions of years along the chain of our mammalian heritage.

I hope that by addressing the knowledge divide first I have not given the impression that the health divide is not of equal or greater importance. The health divide between people and countries is the basis for our concern for equity that I have discussed⁸ before and will be discussed further in this conference. I know you will reflect on what aspects of the divide can be deemed unfair and unjust and thus represent inequity. I know you will reflect on the differences in health outcomes, as well as on those

⁸ Alleyne G. A. O., *Equity and Health*, *Pan American Journal of Public Health*, 2000;7(1):1-7.

determinants that are unequally distributed and contribute to the health divide. The aspect that concerns me here is the relevance of information to that divide.

It is intuitively obvious that the determination of the divide is established on the basis of data on health conditions of persons and countries. PAHO has devoted considerable attention to assisting countries in collecting such data and processing them into information that is useful for making decisions. In the last year we have revived our efforts in health statistics, convinced as we are, that this is the bedrock of all health situation analysis. It is difficult, if not impossible, to derive complex indicators of health status without the kind of basic statistical data that may appear rather mundane, but have stood the test of time in helping us to know what is upon the people.

We have assisted countries in analyzing their data in different ways to provide various kinds of information. For many considerations, a country is a virtual space and unless there is breakdown of the data geographically, it is impossible to determine where the differences occur. We are pleased that the great majority of our countries are now carrying out these kinds of analyses and hopefully using the information to determine where their resources should be applied.

It is not only geographical distribution that is important in elucidating the various differences in health outcomes. One of the more important distributions is that which is based on the gender differential, or better yet, the gender discrimination that makes for differences in health outcomes between men and women. The nature of gender discrimination is a major subject in its own right, but in the present context it is relevant to point out the critical nature of information in both delineating it and suggesting ways of reducing it.

The knowledge and health divides are linked, and there would be some who claim that the knowledge divide is a contributor to the differences in health or inequities that have been referred to by a distinguished ethicist as “arguably the most important ethical problem in the world.”⁹ A recent editorial in the *British Medical Journal*, in referring to this divide, said:

“this is especially sad because increasing access to information increases its value for everybody (because people add new insights) and the marginal cost of electronic information is zero. Publishers, like pharmaceutical companies, need to find ways to provide their goods cheaply in the developing world, and an increasing number are doing so.”¹⁰

This movement is growing and, as an example, access to the electronic editions of the journals of the BMJ publishing group and *Clinical Evidence* will be provided free to the poor countries of the world. Emphasis is also being placed on ensuring that the

⁹ Singer, P.A. – Vision is needed to address problems of global health information. *British Medical Journal*, 2001:322-673.

¹⁰ Godlee F., Horton R. & Smith R., Global information flow. *British Medical Journal*, 2000, 321:776-777.

information flow is bi-directional, and facilitating the publication of research results from the developing world. BIREME has been in the forefront of these initiatives with the development of the Scientific Electronic Library Online (SciELO) that has been lauded as one of the free networks for the exchange of health information. There is however, need for more international cooperation in this field.¹¹

Information is crucial in crossing the divide between the sectors that make up our societies. I often say that we in health have inherited the concept of sectors from the economists and, although society cannot be neatly divided as in the original concept of productive and nonproductive sectors, we have to live with and understand it. In our societies the health sector comprises all the resources and activities directed purposefully towards promoting, protecting, and restoring health. Clearly, there are other sectors whose activities impact on health. Education is important for health, but the resources directed to educating a population do not have, as their primary purpose, the improvement of health. But it is critical for us in health to provide the kind of information that can convince other sectors to, as it were, cross the divide and be proactive for health. This is very much related to the key aspect of health promotion that speaks to the formation of healthy public policy. Good, effectively presented information on the use of seatbelts or the effect of alcohol on morbidity or mortality will be the only thing that can generate the kind of interest in adjusting policy that is pro health. One of the tenets of the primary health care movement was the stimulation of intersectoral collaboration-that there could be crossing of the sectoral divide. This was, and is not as successful as it might be, because we in health have not understood the information needs that would make for such a joining of forces and have in general tended to rely more on the appeal to the humanitarian aspects of health. In addition, we have not always understood how the relevant information should be provided to the decision makers in other sectors, relying more on a certainty in the importance of our own information and displaying attitudes that sometimes smacked of arrogance. The health sector cannot be responsible for the actions of other sectors but it can, and must be so committed to health outcomes, that it provides information that facilitates the actions that bridge the sectoral divide.

Much attention has been given recently to the factors that impede the transfer of information, and the term “digital divide” has come into prominence. A recent OECD publication¹² describes the digital divide as “The gap between individuals, households, businesses, and geographic areas at different socioeconomic levels with regard both to their opportunities to access information and communication technologies (ICTs) and to their use of the Internet for a wide range of activities.” The data on the gaps between the developed and the developing world are staggering. In 1998 there was almost a 10-fold difference between OECD and non-OECD countries with regard to fixed and mobile telecommunication paths per 100 inhabitants. This is the most widely used measure of the international digital divide. The gap in Internet access is even wider. Whereas in

¹¹ Edejer, T. T., Disseminating health information in developing countries: The role of the internet. *British Medical Journal*, 2000, 321:797-800.

¹² Organization for Economic Cooperation and Development. *Understanding the Digital Divide*. OECD 2001. http://www.oecd.org/dsti/sti/prod/digital_divide.pdf.

2000, the non-OECD countries had 0.85 Internet hosts per 1000 inhabitants, the figure for the OECD countries was 82. One of the striking features of these data is that the gaps are widening over the course of years. North America and Europe account for 89 % of all Internet hosts. The number of Internet users is increasing all over the world, and although they are starting at a much lower level, the rate of rise is higher in Latin America than in North America. There is evidence of the divide even in Latin America as Brazil dominates the market in a remarkable fashion.

But there are always promises of even better means of communication that we hope will be less heavily skewed towards richer countries. The Secretary General of the International Telecommunication Union recently issued a report on the prospects for Internet Protocol telephony which will offer much cheaper international communication of voice and data and is said to be an important milestone in the convergence of the communications sector.¹³

We in PAHO, clearly have a stake in having information bridge the various divides that I have mentioned, and in our Region, we have placed a great deal of emphasis and importance on the development of the Virtual Health Library as a tool for doing so. I was proud and pleased that in your last meeting in Costa Rica you strongly endorsed this development in the interaction for disseminating health information that has characterized this Region for many years. You pledged to “construct the Virtual Health Library in a cooperative manner as a unified response to our health situation.” I speak of this with some pride because I remember very well establishing in 1997 an external committee to evaluate the situation and prospects for BIREME.¹⁴ One of the recommendations the committee made to me was to work for the construction, under a common methodology, of the Virtual Regional Library of health science information. I accepted the recommendation and thus the virtual library was born, but it would not have grown to the stage it has without some critical ingredients. First among these, has been the dedication and skill of the current Director of BIREME, Abel Packer, who has insisted all along that he has built on the work and the vision of the Directors who have preceded him. We also owe a tremendous debt of gratitude to the Brazilian government through its ministries of health and education, as well as to the Secretary of the State of Sao Paulo and the Federal University of Sao Paulo. Their support has been crucial in ensuring that the many plans for the Library have come to fruition, and PAHO, as well as the countries of the Americas, will be eternally grateful. I am pleased to see the extent to which the countries of the Americas are entering into the spirit and practice of the Virtual Library; and it is not only the countries of the Americas, because we can record the increasing participation of Spain in our activities. Together you are helping to create what one year ago here in Havana I referred to as the yahoo.com of health information in speaking of the Virtual Health Library.

¹³ Report of the Secretary-General on IP Telephony, International Telecommunication Union, World Telecommunication Policy Forum, 7-9 March 2001. <http://www.itu.int/wtpf/sgreport/index.html>.

¹⁴ Informe de la Comisión externa de evaluación de BIREME, Agosto 1997, PAHO Internal Document.

The nature of our systems and the result of my choice are such that this is the last time I will be addressing you in my capacity as Director of PAHO. I have watched the evolution of these Congresses and have seen the persistence of the view that we are working together to consolidate the position of information as a critical tool for bridging many of the divides to which I referred. Given the history of our Organization and the principles to which it adheres, I cannot even remotely envisage any time when it will not be wedded to the vision of an Americas linked through information, and using it as a tool for the improvement of the health of all our people.

But as I have said to you on other occasions, your task does not end with the purveying of information. It is not enough to be content with the beauty of the systems for collecting, storing, and disseminating information. You also have a responsibility to be aggressive advocates for the proper use of information. The virtuality of this Library to which you are committed is in no way inimical to the reality of the usefulness of the products it offers. You cannot rest until there is evidence that the information lives on in the minds of the recipients and is transformed or transmuted into the knowledge that they want and need. In our case, the finality of the use of that knowledge is the improvement of the health of our people and reducing the unjustifiable and inequitable gaps between them--there can be few things more noble in the field of human endeavor.

This is my last charge to you and with this I say *ave et vale*. ---Hail and farewell!