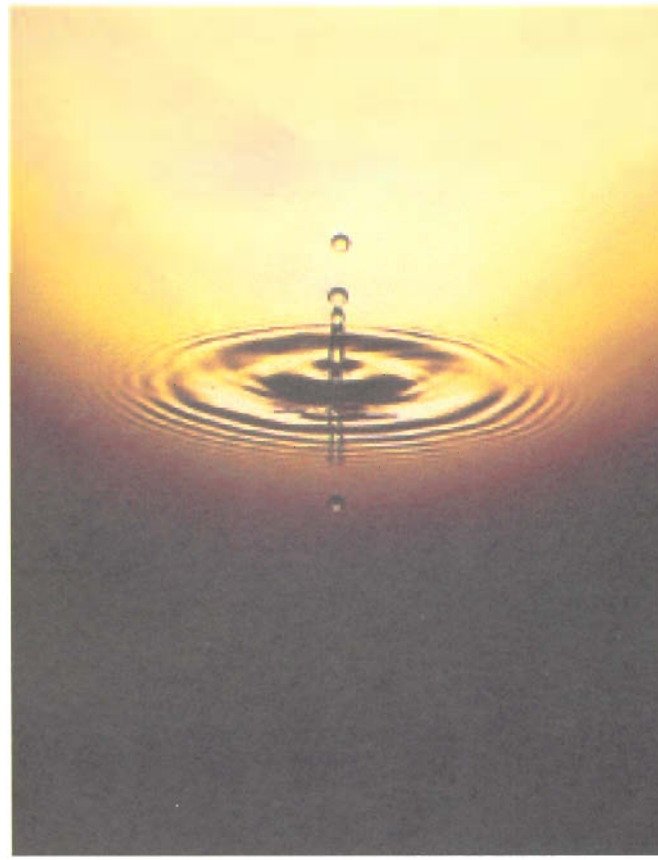
Health Technology Assessment in Latin America and the Caribbean: Collection of Cases



Division of Health Systems and Services Development

Pan American Health Organization
World Health Organization

HEALTH TECHNOLOGY ASSESSMENT IN LATIN AMERICA AND THE CARIBBEAN: COLLECTION OF CASES

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FOREWORD

Since the beginning of this decade, the majority of countries in the Region of the Americas have been reforming or considering the reform of their health systems and services to promote equity in health and access to health services, increasing efficiency in the allocation of the resources, improving the effectiveness and quality of care, ensuring financial sustainability, and encouraging community participation and intersectoral action.

Technology development has played an essential role in health promotion and health systems and services development, and the proper evaluation of its introduction and use can contribute to the achievement of the stated objectives.

Technology is understood as the application of empirical and scientific knowledge for a practical purpose. The term health technology (HT) initially referred to the drugs, equipment and medical devices, and medical and surgical procedures, as well as the organizational models and support systems necessary for their use in patient care.

Since its formulation, this definition has been expanded to: i) include all technologies used for personal health care (for both the healthy and the sick); and ii) emphasize the importance of the personal skills and knowledge necessary for their use, something not sufficiently explicit in the initial definition. In certain cases, technologies used in environmental care have also been included when their relation to human health has been demonstrated. Nevertheless, the initial definition is the most widely disseminated and accepted.

Traditionally, most decisions concerning health technology (a drug, a medical device or equipment, a procedure, a particular way of providing care) have been made by health care providers, especially physicians. Most of the time, such decisions required knowledge about whether the new technology was actually doing what it was designed to do and whether its use produced side effects. Until well into the twentieth century, such information was obtained largely through empirical observation. In recent decades, rigorous clinical trials have been introduced in order to determine the effectiveness of certain treatments.

More recently, the circle of those who "need to know" has been widened and diversified. In addition to service providers, this group now includes lawmakers, officials, health administrators, researchers, managers of pharmaceutical and medical equipment industries, and patients and their families. The nature of the information requested has also broadened. In addition to information on safety, risks, and the efficacy of health technologies (HTs), information is requested on the effectiveness, economic implications, and quality of life associated with their use, and the ethical, cultural, and social implications of their dissemination. In other words, a transition is being made from an assessment based mainly on the needs of HT producers to one that gives priority to the individual and collective needs of HT users.

Assessment of the results of clinical interventions has always existed. The first recorded clinical trial (for the treatment of scurvy) dates back to the eighteenth century. By the 1960s, clinical trials had become a prerequisite for marketing drugs and certain health products. After the creation of the Food and Drug Administration (FDA) in 1931, Health Technology Assessment (HTA), strictly speaking, received a strong boost in the 1970s with the establishment of the Office of Technology Assessment (OTA) by the U.S. Congress. This was the first public agency created for the specific purpose of generating information in this field. Its first report was published in 1976.

At present, HTA is viewed as the "comprehensive way to investigate the technical (almost always clinical), economic, and social consequences of HT utilization, in the short and the long term, as well as its direct and indirect impact, both desirable and undesirable". Assessing a health technology makes it possible "to present information on the patient's alternatives to clinicians, patients, and others", and frequently provides data to orient strategic decision-making related to health insurance coverage or resource allocation, including the purchasing of equipment.

However, HTs often tend to be associated with equipment only (and, more specifically, with expensive and complex equipment), with HTA reduced to procedures for registration and authorization prior to use or to maintenance and supervision during their useful life. Furthermore, although most of the basic concepts of HTA were broadened some time ago to include drug assessment (and, from the 1960s, radiology and laboratory procedures), this does not occur in the other fields included in the previous definition.

Sometimes there is a tendency to confuse HTA with just research. In this regard, it is necessary to bear in mind that basic research seeks to generate new knowledge, whether or not it can be immediately applied, and that applied research uses basic research findings and other sources to give answer to problems in prevention, treatment, cure, or rehabilitation.

In addition, HTA is increasingly understood as an "analytical process aimed at estimating the value and relative contribution of each health technology to the improvement of individual and collective health, taking into account its economic and social impact". HTA, therefore, is not an academic discipline, but rather, a systematic interdisciplinary process whose objective is to effect change.

A basic feature is that health technology assessment is conducted to orient decision-making (by clinicians, patients, financiers and insurers, planners, health service administrators, policymakers, etc.). For that purpose it is grounded in the available basic and applied research and in the comparison of the divergent views of specialists; it is then placed within the context of cost, opportunity, effectiveness, and acceptability. In this regard, it is becoming increasingly important to consider not only the benefits, risks, and costs of HT for those who now have access to it, but also for those who need it but do not have access.

Since the purpose of HTA is to "promote change" rather than "knowledge for knowledge's sake," the strategies for disseminating results and analyzing the factors that promote or hinder the adoption of the conclusions and recommendations are an integral part of the work of those who devote themselves to HTA.

However, HTA differs from health services research/evaluation in the sense that the latter focuses mainly on the way in which resources are organized and how institutions function, as well as on the relationships that they establish among themselves and the environment in which they operate. In this regard, HTA does not depart greatly from the practical work of health professionals (who often work in clinical services or some other service), and research/evaluation of health services deals with these services as a whole. The following example can be used to provide clarification: the decision regarding whether or not to introduce a surgical procedure in question through laparoscopy in a hospital environment often poses problems in assessing the cost-effectiveness and cost-utility of this technique, which fall squarely within the purview of HTA. If in the end a

decision is made to introduce this procedure, it will likely cause additional problems for hospital managers in terms of how to organize this and other laparoscopic procedures for hospitalized patients, what type of human resource training (and how much) is necessary to make the investment in laparoscopes a profitable one, the possible applications of laparoscopic procedures to ambulatory patients, etc. This is a field where HTA and the research/assessment of services begin to come together. As the organizational implications of whether or not to introduce new equipment or procedures extend and spread within the institution, the role of research/assessment of services will grow and the role of HTA will shrink. More examples that show this overlapping between HTA and research/evaluation of health services can be seen in cases 4 ("Health Technology Assessment and Ophthalmologic Care at the Primary Health Level in Chile") and 6 ("The Reorientation of Eye Health in Dominica") included in this publication.

This publication is part of the effort in which PAHO/WHO has been involved to promote HTA as an activity relevant to the development of health systems and services, leadership by the health authorities, and achievement of the goals of effectiveness, quality, and efficiency in the sectoral reform processes. A number of examples of this effort are: i) the incorporation of HTA into the work of many of the technical cooperation programs of the Organization (for example, programs related to communicable and noncommunicable diseases, AIDS and sexually transmitted diseases, veterinary public health, basic sanitation and environmental health, family and population health, lifestyles and mental health, food and nutrition, immunization, essential drugs and technology, and organization and management of health systems and services); ii) the series of subregional seminars and courses on the basic concepts and practical applications of HTA that have been developed since 1996; iii) the preparation and broad dissemination of a document on the development of HTA in Latin America and the Caribbean; iv) the inclusion of a chapter on HTA in the Plan of Action of the Second Summit of the Americas (Santiago, Chile, 1998); v) the support for the creation of HTA units and groups in various countries; vi) growing cooperation with other relevant institutions and international organizations in this field, for example, the International Society of Technology Assessment in Health Care (ISTAHC) and the International Network of Agencies for Health Technology Assessment (INAHTA).

However, the lack of a proper understanding on the part of many policymakers about the importance of HTA in strengthening the steering

role of the health authorities, in health systems and services development, and in the achievement of reform objectives remains a constraint. This publication represents an attempt to help to overcome this by presenting a collection of cases where the application of methodologies linked to HTA or of earlier preparatory or introductory initiatives, have contributed to better decision-making in the area of health systems and services in a series of countries of the Region.

Taking the broad concept of HT that was mentioned at the beginning as the point of departure, the first case pertains to the introduction of better systems for purchasing medical equipment in the main hospital of the Ministry of Health of Panama; the second, to the experience in the application of the basic radiology system recommended by WHO in Haiti; the third, to the establishment of brachytherapy services in a general hospital of Honduras; the fourth, to an assessment of the introduction of a new model of ophthalmologic care at first level services in Chile; the fifth, to the use of routine laboratory testing at the primary and secondary levels of care in Cuba; the sixth, to the reorientation of the eye health program in Dominica; and the seventh, to the introduction of a new, community-based rehabilitation model in Nicaragua.

In some cases, the information was collected and documented by national experts, and in others, by specific individuals with specific responsibilities in the various programs of the Division of Health Systems and Services Development of PAHO, either alone or working in coordination with national professionals. A simple protocol for documenting cases (including background, a description of the problem, the methodology employed for the assessment, the impact of the recommendations, conclusions, and bibliography) was distributed to them beforehand. In one case, a slight modification of the protocol was accepted based on the subject in question. The authors were asked to prepare a text of no more than five typewritten pages. In all cases, authorship is acknowledged and the postal and e-mail address of a professional who will act as focal point for any consultation is also provided. Responsibility for the introduction and conclusions lies exclusively with the editors.[i]

The objective of the editors is to expand and extend the collection of cases, in order to create a active file of relevant HTA cases in the Region,

[i] Dr. A. Infante (Regional Adviser, HSO-HSP) served as the editor-in-chief and Mr. A. Hernandez (HSE-HSP) and Dr. Cari Borrás (HSE-HSP) served as associate editors. They all wish to express their thanks to Dr. E. Fefer for the assistance provided with the preparation of the text.

the full text of which would be accessible in Spanish and English on the pertinent Web Page of the Division of Health Systems and Services Development of PAHO/WHO. To this end, the collection protocol has been included as an appendix. All interested professionals possessing the relevant experience are allowed to complete the protocol and send it to the focal point indicated, with the assurance that a prompt response will be received. This is something greatly encouraged by the editors.

COLLECTION OF CASES

I

1.1 EVALUATION OF MEDICAL EQUIPMENT PURCHASING AT THE SANTO TOMAS HOSPITAL IN PANAMA[ii]

BACKGROUND

The Santo Tomás Hospital opened its doors on 1 September 1926. The first national hospital in Panama, its mission is to offer hospital and health services to the uninsured population of the country. It is the largest hospital of the Ministry of Health and second largest in the country. The equipment repair unit of the Santo Tomás Hospital was established in the 1970s and was called the Medical Electronics section. It had only two technical staff: a technician who repaired telephones and a supervisor. In 1978, the hospital began to bring other technicians in to assist with the equipment repairs. However, its performance was deficient, and international assistance became necessary to improve it.

This assistance was provided through Project Hope, which not only injected a large sum of money to improve the Biomedical Service of the hospital, but also made it possible for the Medical Electronics section to become the Biomedical Department. The impetus given by the project achieved the following: i) the department was restructured, and its objectives and goals were redefined (including the change in the name and the autonomy of the section), b) training courses for technicians were provided, c) testing equipment and tools were acquired that otherwise would not have been purchased, d) maintenance contracts were more closely monitored, d) salaries paid to technical personnel were increased.

However, the hospital continued to experience a certain level of disorganization in the procurement of medical equipment, with consideration being given only to medical criteria. Physicians, particularly

[ii] This case was prepared by Mr. Miguel Talavera, Chief of the National Biomedical Department at the Ministry of Health of Panama and Head of the Biomedical Department at Santo Tomás Hospital (Graduate of Marquette University, Milw., Wis. USA and of the Universidad Tecnológica de Panamá 1998). All correspondence related to this case should be addressed to Mr. Miguel Talavera, Apartado Postal 87-1195, Zone 7, Panama, Email: hst@sinfo.net.

the Chiefs of Service, were the ones who prepared the technical specifications of the equipment and also the technical procurement criteria.

Description of the Problem

There were two main problems concerning medical technology acquisition: i) this equipment was acquired at a cost above the average price as a result of regulations pertaining to taxes, which, until 1998, amounted to 27.5% of the CIF cost of the equipment, and ii) the use assigned to the equipment, since normally purchase requisitions did not include sufficient supplies for its continued operation, installation, and pre-installation requirements, service manuals, and technical training for Biomedical Department staff. As a result, new equipment broke down or remained in boxes, waiting long periods for supplies or accessories for its use or for changes to be made in the physical plant for installation purposes.

One example of this situation was the procurement of equipment for the new diagnostic imaging room of the hospital in 1993—equipment that was not installed until 1998, since there was no space available. The same thing happened with the purchase of a specific type of ventilator, whose warranty expired while the equipment was still in boxes. Other equipment had supplies permitting use only for a short period, creating the need for the immediate purchase of these supplies; this means that while they were being purchased, the equipment could not be used. Worse yet, several months could go by before the supplies were received, resulting in the expiration of the warranty on the equipment.

Methodology Used for the Assessment

One of the things that was sought with the addition of a foreign-trained biomedical engineer to the unit in late 1994 was the resumption by the Biomedical Department of the functions consistent with its mission. Initially, with the support of the Medical Director, the Biomedical Department was charged with the responsibility of preparing the technical specifications for procurement and the technical criteria for the selection of medical equipment.

The first is very important, since the technical specifications should reflect how work will be done, under what conditions work will be performed, and in general, the circumstances and factors that can alter the proper operation of the equipment. The publications of the Emergency

Care Research Institute (ECRI) are one valuable source of information in this regard. Also required is a good knowledge of the facilities where the equipment will be operated, with special attention being paid to the space required, means of access of the equipment to the area, electrical installations, cold and hot water, steam, and the mobility of the equipment, while not losing sight of the harmonious integration of the area with the rest of the facilities.

With regard to the second, the provisions of Law 56 of 27 December 1995 regulating government procurement were consulted. The two principal aspects of this Law are: i) the supplier does not have an obligation to provide what does not appear on the purchase order; for example, it was common, in the case of equipment that had a printer, not to include enough paper in purchase orders and to waste the paper that came with the printer during the installation and testing period; also the service manual was often omitted in purchase orders, which meant that the suppliers did not have an obligation to provide it, and, in fact, they later wanted to sell it for an additional sum or to state simply that it was a "confidential" document; ii) technicians can issue written opinions (see Annex) only in the form of numerical tables in which aspects of the equipment are weighted, and weighting should be included in the purchase requisition, for example: price: 35%, characteristics and specifications: 40%, and technical support: 35%.

Once these points had been clarified, leadership could be assumed with respect to equipment procurement processes.

Dissemination and Impact of the Recommendations

Having the support of the director of the hospital made it possible to channel the preparation of specifications and to monitor the purchase of spare parts for the equipments. Initially, many duplications were detected and corrected (that is, the Chiefs of Service requested parts—sometimes following the technically baseless suggestions of vendors—and the Biomedical Department requested these parts for that unit or equipment). Although some chiefs of service have resented the fact that the Biomedical Department controls technical evaluations, in general this procedure has been accepted as being the best. Furthermore, many Chiefs of Service support control of this task by the Biomedical Department.

The changes made in the method for assessing medical equipment technology have had a positive impact on its procurement at the Santo

Tomás Hospital, as seen in the following: i) the equipment acquired is totally functional, which avoids spending additional money after the purchase of new equipment; ii) the equipment does not include features that are not useful and whose cost is not reflected in the purchase; iii) the disorganized purchase of spare parts is avoided; and when it does occur, the purchase order is sent to the Biomedical Department, which conducts a technical evaluation of the situation before proceeding with the purchase, through a public mechanism that is legally regulated in Panama; iv) maximum benefit is derived from the limited resources allocated to the purchase of equipment, thereby increasing the efficiency and effectiveness of the budget.

CONCLUSIONS

The organization and strengthening of the Department of Biomedical Engineering at the Santo Tomás Hospital has had a positive impact on the purchase of medical equipment at that hospital. This impact would not have been possible without the wholehearted support of the Medical Office of the Director and the management of the center. At the beginning, some physicians, particularly some Chiefs of Service, had misgivings about this work. However, several years of practical experience have helped to provide reassurance and to create a cooperative relationship between clinicians and the personnel of the department at the time for preparing the technical specifications for procurement and for specifying the technical features for the selection of the equipment.

The Department has also had a positive impact in the critical area of the purchase of spare parts and equipment supplies. This impact can be even greater if these procedures are applied to the other facilities of the Ministry of Health, which, for policy reasons related to decentralization, leaves all biomedical planning in the hands of the different health regions of the Republic of Panama.

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TABLE 1: EXAMPLE OF A TECHNICAL CRITERIA DOCUMENT BASED ON THE LAW ON GOVERNMENT PROCUREMENT

OFFICIAL DOCUMENT

Purpose: Meeting on Technical Criteria for Request 97-267 of 30 November 1997, for the purchase of ultrasound equipment with an additional transvaginal transducer.

RESULTS:

Option	Price 40%	Specifications 60%	Total 100%
1. A	34.8	55	89.8
2. B	*	*	*
3. C	36.99	55	91.99
4. D	26.06	40	66.06
5. E	40	60	100

OBSERVATIONS:

Option 1: A clear proposal was not submitted. There is no indication about whether a video printer will be provided.

*Option 2: It was eliminated at the time of the official proceedings due to the failure to provide a performance guarantee.

Option 3: Does not include carrying cart.

Option 4: Does not include carrying cart or video printer, and a clear bid was not made.

Option 5: Like offer 3, they were the only ones who submitted a clear bid. To be awarded to the best bidder.

Done in the city of Panama, on the ___ day of _____ , 199_.

In witness whereof, we hereby sign:

_____ _____

Public Official Contractor

1.2 THE WORLD HEALTH IMAGING SYSTEM FOR RADIOGRAPHY IN HAITI[iii]

BACKGROUND

Over the past decade Haiti has faced unprecedented turmoil marked by severe political and social upheavals. These unfolding disasters led the country into civil strife and economic instability with the impact of the 1991-1994 embargo. During the embargo the economy deteriorated at a rapid pace, leaving the country as the poorest in the western hemisphere with a gross domestic product (GDP) around US$ 300 per capita.

As a consequence, tremendous strain has been placed upon the Haitian health care system. In March 1996, the Ministry of Health implemented a policy acknowledging the right to health and the obligation to guarantee health for all. However, Haiti's health and social indicators still remain as one of the poorest in the Western Hemisphere. Indicators for child mortality as reported by the EMMUS II (Survey on Morbidity, Mortality and Use of Services) demonstrate that the leading causes of death are attributed to diarrheal diseases, acute respiratory infections, and malnutrition with 74 deaths per 100,000 live births.[1]

As with many countries in the world facing the rapid increase of tuberculosis (TB) together with the global emergence of multiple drug resistance TB (MDR TB) and HIV/AIDS, Haiti faces similar dilemmas. These infections are quickly becoming the leading killers of young adults. According to the World Health Organization (WHO), during 1981-1991, more than 6,000 new cases of TB were reported in Haiti. Estimates indicate that the incidence is likely to be 180 per 100,000 inhabitants. Some of the factors responsible for transmission are due to Haiti's poverty, economic disparities, political instability and poor health infrastructure, coupled with immunocompromised populations afflicted with HIV/AIDS and the emergence of MDR TB. According to PAHO's publication "Health Conditions in the Americas", country studies for Haiti indicated that in 1991 50% of all patients with AIDS were infected with TB. In 1996, seroprevalence studies among children established a close

[iii] This case was prepared by Dr. Cari Borrás and Ms. María Teresa Gago (HSE/HSP). All the correspondency related to it can be mailed to: Dr. C. Borrás, PAHO/WHO, 525 23rd St. N.W., Washington D.C. 20037, Email: borrasca@paho.org.

correlation between TB and HIV/AIDS. Currently, there are more than three million deaths a year in the world related to TB alone.

The diagnosis of TB is based on careful assessment of risk of exposure, sputum smears and tuberculin skin testing and when possible, evaluation of chest radiographs. The diagnosis of TB based on conventional tuberculin skin test may not be an effective and reliable screening method, especially for the chronically ill and elderly populations. These populations are considered to be at high risk of having TB. Therefore, chest x-rays are necessary in evaluating the extent of pulmonary TB, its progression and response to therapy; thereby bringing those with severe cases of TB and who are contagious under treatment.[2] Patients with active TB require periodic chest x-rays at scheduled intervals. Patients who fail to complete the full course of pharmaceuticals may require further chest x-rays to monitor the disease.

The need for basic diagnostic equipment is an essential component to any health service. Major areas that require diagnosis and management of diseases by health technology equipment include: Trauma (due to accidents and acts of violence); infection, such as TB and acute respiratory infection affecting primarily children and the elderly; tropical disease (in the diagnosis of various parasitic diseases such as amebiasis and schistosomiasis); intra-abdominal pathology (important in the detection of kidney stones, gall stones, obstructions and tumors that may be found in the abdomen); obstetrics (such as ultra-sound to assess fetal growth).[3]

Description of the Problem

Access to diagnostic and other imaging equipment in most developing countries is far from being equitable; approximately only two-thirds of the world's population have access to such services. Most of the rural and urban poor populations have no access at all. The majority of the diagnostic and imaging services can be found in the larger cities where the quality and care received maybe questionable. Furthermore, estimates indicate that 30-60% of the imaging equipment that does exist may not be in working order.

To assess the situation of the diagnostic radiology services in Haiti, in August 1995, ten facilities were visited by PAHO's radiological health adviser. Five of them were in Port-au-Prince, and five outside, in St. Croix, St. Marc, Deschapelles, Porte-de-Paix and Jacmel. The facilities were

inspected from the viewpoints of equipment and supplies, human resources, protocols and statistics, maintenance, radiation protection and quality assurance. The results are shown in Tables 2 and 3. None of the Philips Multi-Radiographic Systems (MRS), installed in 1993-1994, certified by WHO as a "World Health Imaging System for Radiography (WHIS-RAD)" was found working. The reasons were not ascertained, but design flaws were suspected. In addition, serious deficiencies were observed, mainly regarding x-ray technician training, maintenance services, structural shielding and personnel dosimetry.[4]

METHODOLOGY USED FOR THE EVALUATION

An assessment of the incorporation of the WHIS-RAD technology in Haiti ensued. The concept is an upgrade of WHO's Basic Radiological System (WHO-BRS), introduced in 1980, as a "safe, inexpensive diagnostic imaging system for developing countries", which includes a battery power generator to overcome problems with undependable electricity, training manuals for radiographic and darkroom techniques and for radiographic interpretation. The WHIS-RAD technology incorporated computerized x-ray controls and diagnostic software to the same x-ray tube and support stand, which permits general-purpose radiography, including chest x-rays. A revision of the technical specifications published by WHO in 1995[5] led to the conclusion that, given the situation in Haiti, the choice of the technology was correct; what had to be wrong was the x-ray brand. Thus, it was decided to contract the manufacturer to repair the units and convince the health care providers to train the personnel.

A team composed by two Philips engineers, PAHO's radiological health adviser, and an independent PAHO-contracted x-ray engineer worked in Haiti in November 1995, but was able to fix only three of the six installed units, due to lack of spare parts. The PAHO-contracted engineer advised against the MRS units, stating that: "The complexity of the x-ray generator and the level of expertise and training required to keep these 'simple' units operating is unnecessarily high. A longer term option might be to replace the XHF generators with a more reliable and service friendly x-ray generator while maintaining the existing tube stand." His recommendation was that future x-ray units in Haiti be of non-WHIS-RAD type, and that power supply problems in Haiti be overcome by purchasing a power generator with each x-ray unit, foregoing the concept of battery-charged electrical storage units.[6] The suggestion was not followed and four new x-ray machines were bought from Bennett, a different manufacturer of WHIS-RAD units.

TABLE 2: SUMMARY OF DIAGNOSTIC RADIOLOGY DEPARTMENTS (PORT-AU-PRINCE HOSPITALS)

Parameter/ Hospitals	St. Catherine	La Saline	CSBM	Grace	Université
Population	?	?	?	?	?
No. Beds	110	36	Ambulatory	?	
No. X-ray Units					
MRS	1 (N)	1 (N)	-	1 (N)	2 (N)
Other	-	1R (N) + 1P (N)	1R + 1P	1R	1R + 1F (N)
Darkroom	1M	1A	1A	1M	2A
Ultrasound Units	-	-	1	?	?
No. Radiologists	1	-	1	-	5
No. Technicians	2	1	1	2	7
No. Films/Month	565	390	288	800	4,500
Film Type	Kodak ABS	Kodak?	Kodak?	Kodak	Kodak?
Screen Type	Kodak	Kodak?	Kodak?	Cronex	Kodak?
Maintenance	None?	On site	None?	None?	?
Structural Shielding	OK?	Need Pb in booth	Need Pb in chest film holder	Need Pb in booth	Need Pb in booth
Personnel Dosimetry	None	None	None	None	None
Leaded Aprons/Gloves	None	Apron + Thyroid	None?	?	Meditech

MRS: Philips Multiradiographic system; R: Fixed Radiographic; P: Portable Radiographic; F: Fluoroscopic Unit
A: Automatic; M: Manual; N: Does not work

TABLE 3: SUMMARY OF DIAGNOSTIC RADIOLOGY DEPARTMENTS (HOSPITALS OUTSIDE PORT-AU-PRINCE)

Parameter/Hospital	St. Croix (Léogâne)	St. Nicolas (St. Marc)	Albert Schwetizer (Deschapelles)	Beraca (Porte-de-Paix)	St. Michel (Jacmel)
Population	?	150,000	200,000-250,000	500,000	450,000
No. Beds	?	80-90	120	32	90-96
No. X-ray Units					
MRS	-	-	1 (N)	1 (I)	-
Other	1R+1R (N)+1P	-	IR+1P	2P	-
Darkroom	1M	-	1M	1M	-
Ultrasound Units	-	-	-	-	-
No. of Radiologists	1	1T	-	-	1
No. of Technicians	1	3	5	1+1(S)	3
No. Films/Month	256	~ 750	~ 1,300	180	-
Film Type	Kodak, Fuji	-	Agfa/Curix XP	Kodak	-
Screen Type	Kyokko, Fuji, AW, Cronex	-	F1 Curix	Dupont Cronex	-
Maintenance	Meditech	?	On site	?	?
Structural Shielding	To be calculated	To be calculated	OK?	OK?	To be calculated
Personnel Dosimetry	None	None	Film-Siemens	None	None
Leaded Aprons/gloves	None	-	Aprons?	?	?

MRS: Philips Multiradiographic System; R: Fixed Radiographic; P: Portable Radiographic; F: Fluoroscopic Unit; A: Automatic; M: Manual; N: Does not work; I: To be installed; T: Twice a week; A: Assistant.

Dissemination and Impact of the Recommendations

Due to the political instability and scarcity of financial resources, none of the recommendations concerning radiation protection, training and maintenance were implemented. The Ministry of Health did not take appropriate actions concerning the implementation of a radiation safety infrastructure either. The consequence was that the repairs of the MRS units conducted in 1996 and 1997,[7] which were always satisfactory, and that even included the replacement by Philips of all their x-ray generators, did not last. The Bennett units fared a little better, mainly because of the efforts of a local x-ray company representing the manufacturer. The main problems stemmed from the technology design itself. The electrical supply units consist of batteries which—like car batteries—need to run to keep their charge. After a period of non-usage, the batteries become unchargeable. The problem that occurs most often is a blown fuse due to a power surge, so common in Haiti, which the poorly trained x-ray technicians do not know how to replace! As a result, the unit becomes inoperable, and after a certain time, the battery is discharged to a level that it can no longer be recharged!

Conclusions

The application of the WHIS-RAD technology to countries with the characteristics of Haiti, is being reconsidered by WHO. Alternative solutions are being studied by a panel of experts.

In the meantime, efforts continue at the regional level to seek funds for Haiti to provide basic training to the x-ray technicians in the radiology services, create a university-based maintenance training program, set up a maintenance contract with the x-ray manufacturers—both Philips and Bennett—and establish a radiation protection program at the national level. Only under these circumstances it is felt that any x-ray technology will function adequately.

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1.3 Establishment of Brachytherapy Services in San Felipe General Hospital, Tegucigalpa, Honduras[iv]

Background

Twenty five thousand to thirty five thousand Latin American women die each year due to cervical cancer, notably affecting the countries of Central America and the Caribbean. This population represents 10% to 15% of cancer mortality among women. In Honduras, the severity of the problem was reflected in maternal death studies during 1989 and 1990, where 12% of deaths in women of the reproductive age were attributed to malignant tumors, 40% of which corresponded to cancer of the cervix. The Pan American Health Organization/World Health Organization (PAHO/WHO) has called attention to this problem and has appealed to the countries to define policies and programs for prevention and control.[1]

Early detection and appropriate treatment significantly reduces the chances of women dying from this type cancer. However, some state health systems do not have the proper technical capacities and/or financial means to support wide intervention programs that include prevention, detection and appropriate treatment. Often the technical levels of the health personnel and managerial capabilities have become restrictions, along with limited resources. Women in general and especially those who live in rural areas are not always able to reach health services due to lack of proper health education and the geographical distances involved. In addition to these inhibiting factors, socioeconomic and cultural barriers are also evident.

Currently, Central American countries are undergoing or negotiating healthcare reform projects. In this process, basic healthcare packages are designed to include control programs for cancer of the cervix, including treatments with radiation. Due to limited resources and financial

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constraints of these countries, donations of valuable medical devices have great potential uses and benefits.

Description of the Problem

In order to serve a population close to 6 million inhabitants with an 8.2% cancer mortality in 1990, Honduras has three radiation therapy services: one in the Hospital San Felipe and one in the Center of Cancer Emma Romero de Callejas in Tegucigalpa; the third one, the League Against Cancer, is in San Pedro Sula. Each service counted in 1997 with a cobalt therapy unit: two Theratron-80s in Tegucigalpa and one El Dorado-8 in San Pedro Sula. In addition, this last center had Cesium-137 sources for brachytherapy applications. With regard to human resources, there are 5 radiation oncologists, 1 medical physicist, and some 15 auxiliaries between technologists and dosimetrists. In 1997 these services treated respectively 536, 397, and 465 patient with external radiation therapy. The number of brachytherapy treatments is unknown.

On 24 December 1997, the Cobalt-60 source of the Theratron-80 unit of the Hospital San Felipe remained in the position of irradiation upon finishing the treatment of a patient, instead of receding to the safety position within the head. Thanks to the PAHO office in Honduras, the hospital contracted a local medical physicist, who evaluated the state of the unit and the significance of the accident from a dosimetric point of view. The conclusion was that, given the deteriorated condition of the machine and the numerous mechanical problems uncovered, there was no point to repair the source mechanism. The consequence was that radiotherapy treatments in the Hospital San Felipe were interrupted from that date on, with the obvious devastating consequences.

Methodology Used for the Evaluation

The situation was independently assessed by PAHO's radiological health adviser who is a medical physicist with 35 years of experience, most of them in radiotherapy physics, and whose main role at PAHO is to advise ministries of health on appropriate radiological technologies. From bibliographic references, she documented the following points:

While surgery and radiotherapy are equally applicable in early stage disease (1A), radiotherapy is the option of choice in later stages, including palliation. To eradicate the tumor, large doses of radiation have to be delivered to the vagina, parametrium and lower part of the body of the

uterus, which have high tolerances to the radiation, while sparing the bladder and rectum, which are more radiosensitive. This is achieved through brachytherapy, a technology that consists in inserting intracavitary radioactive sources in the uterus and in the fornices of the vagina. Lymph node involvement, when present, needs to be treated with external radiation therapy.[2] If the technique is applied correctly, tumor control rates may be as high as 97% for stages IIA and IB, 90% for stage IIB and 77% for IIIB, with quite tolerable morbidity sequelae in the urinary and gastrointestinal tracts. Five-year survival rates range 83–85% for stage IB, 70-100% for Stage IIA, 50-68% for IIB and 20-45% for IIIB, depending on the technique of treatment used.[3]

Thus, she concluded that for effective cancer treatment, the most needed technology was brachytherapy, followed by additional high-energy external radiation therapy, a decision that was supported by the health authorities.

Dissemination and Impact of the Recommendations

Fortuitously, the U.S. National Institutes of Health presented PAHO with a surplus medical device, a Nucletron Selectron LDR/MDR, Cesium-137, a remote afterloading brachytherapy device, which was considered to be an upgrade from existing manual brachytherapy systems.

Equipment donations is another aspect of the Radiological Health program at PAHO, which has strict criteria for accepting radiation emitting devices. To ensure an effective and coordinated donation process, certain measures are taken. In this case, they included checking the completeness of the equipment components; the mechanical and electronic performance of the system, according to manufacturer's specifications; the accuracy of the activity and integrity of the radioactive sources; the adequate functioning of the treatment planning computer hardware and software, and the provision of operation and maintenance manuals.

The equipment was offered to the Government of Honduras and graciously accepted by its Minister of Health, upon whose responsibility also befell the authorization for the transportation and possession of the radioactive sources.

To ensure that the unit met manufacturer specifications, Nucletron was contracted by PAHO to overhaul the unit and install it in the hospital. PAHO also contracted the NIH physicist who had been in charge of the

Selectron unit prior to its donation to Honduras, to evaluate radiation shielding needs. This physicist provided the facility with copies of the NIH protocols for the following procedures: pretreatment follow-up, documentation of treatments, and emergency situations.

To assess the changes needed in the physical facility to ensure good patient management, the treatment facility was inspected by PAHO's radiological health adviser, the local medical physicist, the director of the Honduras Cancer program and a radiation oncologist from the Catalan Institute of Oncology in Spain, contracted by PAHO to offer managerial suggestions. The team made several recommendations to improve patient comfort and adequate nursing coverage. To incorporate the proposed design features with the radiation safety requirements, the PAHO physicist and the local physicist revised the structural shielding recommendations made by the NIH physicist and made additional suggestions. The Ministry of Health paid for the needed building modifications and assumed the responsibility for future equipment maintenance costs.

After all installation changes were agreed upon by the hospital management and the health authorities, PAHO's Radiological Health program contracted an independent medical physicist familiar with the equipment to perform the acceptance tests and provide initial training in equipment use and clinical dosimetry. This physicist went to Honduras accompanied by a radiation oncologist and a brachytherapy nurse, who provided training in clinical and nursing aspects.[4,5,6,7] To ensure consistency of opinions, this team belonged to the Catalan Institute of Oncology, the Spanish facility where the radiation oncologist who first visited Honduras worked.

Recognizing that to guarantee the sustainability of any program, the strengthening of human resources is a vital component, PAHO's radiological health program also mobilized external resources for a comprehensive training program for clinicians, technicians, nurses, dosimetrists and physicists. A proposal was jointly prepared by the Ministry of Health of Honduras, the "Centro Nacional de Física de las Radiaciones" from the "Universidad Nacional Autónoma de Honduras," and PAHO's regional and country offices. Extra-budgetary resources for this purpose were requested and secured from the Ministry of Health of Spain.

Given the need to complete brachytherapy with external beam radiotherapy services, the PAHO/WHO representative was influential in

obtaining the support of the first lady of Honduras Ms. Marie Flake de Flores. She convinced the Government of Japan to buy a modern cobalt therapy unit and finance a whole new radiation therapy department at the San Felipe Hospital, including the required structural shielding.

CONCLUSIONS

The upgrading of radiation therapy services in Honduras with the incorporation of a new technology such as low dose-rate remote-afterloading brachytherapy will result in improvements in cancer control and survival rates.

Acceptance of any medical equipment and introduction to a new technology is a challenge, especially if it involves managerial and technical changes. In order to obtain optimum results, it is imperative that proper coordination and communication be established between national and international counterparts.

The achievements described here could only be accomplished through an excellent cooperation between PAHO's regional program, PAHO's country office in Honduras, the Ministry of Health (especially its Cancer Program), the Director of the San Felipe General Hospital, the Head of the Radiation Oncology Department, a physicist from the "Centro Nacional de Física de las Radiaciones" from the "Universidad Nacional Autónoma de Honduras", Nucletron/USA, Nucletron/Holland, the United States National Institutes of Health, and physicists, radiation oncologists and nurses of the "Instituto Catalán de Oncología" in Barcelona, Spain.

It is hoped that political changes and other Ministry of Health priorities, often those dictated by natural disasters, such as the effects of a hurricane, do not handicap the advances obtained in the fight against cancer.

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1.4 Health Technology Assessment and Ophthalmologic Care at the Primary Health Level in Chile[v]

Background

The model of care of the Chilean public system has placed emphasis during the last decade on primary health care and has strengthened outpatient care. The traditional physician's offices attached to the more complex hospitals have been replaced with Diagnostic and Treatment Centers (CDT), which have been equipped with moderately to highly complex technology for outpatient care, including surgery and diagnostic imaging or therapeutic procedures. Furthermore, Health Referral Centers (CRS) have been created to coordinate treatment by specialists in regions with the greatest demand for care. These centers receive patients for evaluation from various urban general practitioners' offices, and send them back with specific instructions or refer them for care at third-level centers. Finally, since 1996, Family Health Centers have been established where specialists have been hired for the disciplines where the demand is greatest, including ophthalmologic care.

Since the 1980s, WHO has promoted the Program for the Prevention of Blindness,[1] whose main objective is to prevent and control the most frequent causes of vision loss and to make eye care available to everyone. Chile is one of 12 countries of the Americas that did not have an Eye Health Program in 1996. However, in recent years, the health authorities and ophthalmologists in the country have been making a serious effort to address this problem.

In October 1997, on the occasion of the "Subregional Course on Health Technology Assessment (HTA)",[2] held in Santiago, sponsored by PAHO/WHO and attended by professionals from Chile and other Southern Cone countries, a Round Table was held, entitled "Refractometry: Effectiveness, Usefulness, and Contextualization of its Use in Chile." Among the participants were Drs. José Luis Conde (Spanish Agency for Health Technology Assessment, AETS), Renaldo Battista (CETS, Canada),

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José Asua (President, INAHTA and Director, Osteba, Basque HTA Agency), and César Vicencio (Vice President, Chilean Society of Ophthalmology). Its purpose was to address the subject from the standpoint of HTA and, more specifically, to help to determine the strengths and weaknesses of the Chilean organizational model for outpatient ophthalmologic care, which was being developed in the country at that time.

Description of the Problem

In the mid-1990s, Latin America had 1 ophthalmologist for every 36,000 population, with refractory defects being handled not only by ophthalmologists but optometrists as well. In early 1997, the situation was similar in Chile, which had a model of care that used only medical specialists to address these problems. The rate of ophthalmologists in the Chilean public system for medical care, which serves 70% of the population, was 1 ophthalmologist per 90,000 population. Furthermore, the ophthalmologists were concentrated in the area of Santiago, the capital of the country, while three regional health services lacked these specialists. The supply in the private sector was also limited, with 83% of these specialists located in the three most industrialized regions and densely populated urban areas.

Traditionally, the capacity to train specialists in the country has been much lower than the need. It is estimated that seven specialists per year have been trained in recent years, only two of whom made a commitment to provide three years of service in the public health system, with the others working in the private sector. Given the lack of centers that provide training in this specialty, efforts have been made recently to train them abroad and then have them receive certification from the National Commission for the Certification of Medical Specialties (CONACEM), an autonomous agency made up of the schools of medicine and scientific societies.

Furthermore, the supply of ophthalmologists has been concentrated at the tertiary level of care, and most of their available hours are spent meeting the growing demand of patients with refraction defects. This has led to long waiting lists both for clinical treatment and for surgery related to these conditions.

Within the public system, the Eastern Metropolitan Health service, El Salvador Hospital, is the only one with an emergency center for eye trauma.

The supply in the private sector was also limited and concentrated in the three regions with greatest population density (Metropolitan Region, and Regions V and VIII) where 83% of these specialists were located. The cost of care in the private system ranges from US$35 to $90, plus the cost of glasses, which is US$25 or more. For this reason, many patients who manage to obtain a prescription for glasses end up not getting them, and after a year set up an appointment for another consultation in order to obtain a new prescription.

From the technology standpoint, a high level of obsolescence in both medical care and ophthalmologic surgery was noted. In 1993, it became possible to repair equipment through projects funded by the World Bank, the Interamerican Development Bank (IDB) and through other national and sectoral funds.

Several studies by the Division of Primary Care[3] of the Ministry of Health showed that ophthalmology is one of the specialties with the highest demand for consultations (ophthalmologic rate of demand: 2.47 for every 100 consultations with specialists). However, the Medical Network Study[4] suggested that were it not for restricted supply (hidden demand), the ophthalmologic referral rate would rise to 7 per 100 of all consultations with specialists.

Against this backdrop, care for refraction defects in the population aged 15 and over was included as a presidential priority on the Social Agenda, prepared in March 1998, to be implemented over a two-year period, with a pilot plan starting up in June in the Metropolitan, V and VIII Regions.

After an initial period of preparation, and in part as a consequence of the discussion mentioned above, in April 1998 the Ministry of Health and the Chilean Society of Ophthalmology agreed on a plan for treating refraction defects. This plan acknowledged the needs of the population and the shortage of ophthalmologists to meet these needs, establishing the objective of strengthening diagnostic and therapeutic capacity with regard to refraction defects at the primary care level.

The Health Technology Assessment (HTA) Unit (ETESA), created in mid-1997 and placed under the Investments Division of the Ministry of Health, supported the entire process from the outset.

METHODOLOGY USED FOR THE ASSESSMENT

Once the National Eye Health Commission provided for in Plan was formed, the HTA Unit was assigned the task of collecting the best evidence available on diagnostic methods, applicable technologies, and human resources necessary for providing proper care for refraction defects at the primary level. It was also given the job of preparing an investment proposal to secure the financing, the preparation of the technical specifications of the proposed equipment, and the technical evaluation of the bids received.

The Ministry of Health's Division of Primary Care prepared the diagnostic study of the network at the primary level and the profile of the beneficiary population registered, identifying the physician's offices and family health care centers where the demand was greatest.

The Chilean Society of Ophthalmology prepared the profile for visual health screening, developed the training program for the personnel that would conduct the screening, and was responsible for the sensitization, registry, and coordination of ophthalmologists who signed onto the plan through a contract.

FONASA, the public health insurance system, monitored the transfer of funds and the contribution channeled through the Program for Older Adults; and the Ministry of Health Supply Center handled the procurement and distribution of equipment. Finally, the Human Resources Division of the Ministry of Health was responsible for the coordination of the National Commission.

After analysis of the evidence available, the National Commission produced two general recommendations: i) include a basic visual health examination as part of the health check-up of adults; and ii) procure the technology and resources necessary for treating refraction defects at the primary health level, including the provision of glasses.

Based on those recommendations, two strategies were developed:

- Provision of eye health screening for every patient aged 15 or over and suspected of having a refraction defect by the general practitioner and/or health program nurse. A visual acuity examination would be conducted using a protocol, with an eye chart, a card for close reading, and stenopeic equipment. The examination should be conducted by medical technologist, nurse,

or trained nursing auxiliary, depending on the resources available. Every patient under the age of 45 with visual acuity of < 0.5, or over 45 with close-up visual acuity of <1 would be referred to an ophthalmologist at the same office.

- Diagnosis and treatment of refraction defects: care would be provided by an ophthalmologist, through a service agreement under the agreement between the Ministry of Health and the Chilean Society of Ophthalmology, whereby the Society agrees to provide the specialists, and the Ministry of Health, to provide the technology, infrastructure, and supplies (drugs, glasses). The ophthalmologic consultation equipment includes: an autorefractometer, a cleft lamp, tonometer, ophthalmoscope-retinoscope, box of glasses with trial frames, optotype projector, lensometer, a table for the equipment, and an automatic swivel chair. Glasses are delivered directly to the facility that provides the care, through competitive bidding for optical services.

The objective of all this is to shorten ophthalmologic waiting lists and redistribute the supply of surgical hours by providing primary care for the most frequent reason for consultation (refraction defects), with referrals made to the second level only for more complex conditions.

The Ministry of Health has set the goal of providing care to 45,000 individuals during the second half of 1998, although based on the rate, the actual demand could be more than 95,000 for this age group in the three regions selected. The under 15 population has not been included, since there is a school eye health program funded and executed by the Ministry of Education.

In 1999, the goal is to expand care to the rest of the country, with a target population of some 160,000 patients and a goal of 70,000 consultations.

The creation of 60 ophthalmologic care modules at the primary level has been projected. Of these, 40 will be urban general practitioner's offices, selected according to the criteria of population, geographical location, poverty index of the commune; 20 additional modules will be located in Family Health Centers.

Funding for care and glasses was provided to each commune in the areas included in this pilot plan. Using volume as an argument in negotiations with suppliers and service providers, a significant reduction in

market prices in these two areas was obtained at the beginning of the Plan of Action.

Dissemination and Impact of the Recommendations

The information on the evidence available was requested by the health authorities of the HTA Unit with a view to applying its recommendations and improving the current ophthalmologic care provided by the system. Teamwork made it possible to apply the evidence, to establish a more open dialogue in the search for solutions and, in the brief period involved, to achieve a certain impact. This impact should be even greater in 1999, once the centers are outfitted and the equipment installed.

At the end of 1998, an initial partial impact assessment was done, whose data are shown below. The goal of 36,000 consultations was adjusted proportionately to the actual application time during the period September–December 1998, which meant that 83.8% of the goal was met[5] (30,173 consultations). Follow-up work involved a total of 20 urban general practitioner's offices and 17 family health centers that were in operation during this phase (see table 4). Unfortunately, some communes did not group patients by age intervals of 15 to 45, 45 to 65, and over 65; however, based on the available information, 25% of the population served was over the age of 65. There was a referral rate of 12.9% for secondary pathologies, and the data corresponding to the diagnoses of referred patients is not available. A total of 28,760 pairs of glasses were provided (28.2% of the patients received two pairs of glasses) (see table 5).

Furthermore, to illustrate the application methodology, the "First Day for Evaluating the Program on Specialties and Refraction Defects" was organized at the national level, in which primary care representatives and decisionmakers from the regional health services participated.

Thus far, the pilot plan has required an investment of Ch$410,769, equivalent to US$912,000, and the main achievements have consisted of:

1) Incorporating a protocol for the basic visual health examination into preventive adult care.

2) Increasing the ability to diagnose refraction defects (115% in the three pilot regions). This is equivalent to 113 ophthalmologists working 22 hours a week in the public system.

3) Giving satisfaction to the user by furnishing glasses.

4) Intervening in terms of the market cost of consultations with specialists and glasses (average cost of the program: US$23 per patient per consultation, including glasses).

5) Reorganizing the overall functioning of the ophthalmologic care network.

6) Providing temporary solutions to these problems in the regions that need specialists, through the service agreement with the specialists provided by the Society of Ophthalmology (the case of the Magallanes Regional Health Services is representative because of the increased need for eye care due to the damage to the ozone layer).

7) Facilitating the return of ophthalmologists who were grant recipients to the regions.

The main difficulties encountered were:

1) The lack of formal training to conduct the screening.

2) Administrative coordination problems linked to the transfer of funds for primary care provided by the municipios.

3) Coordination problems between the end provider (specialist) and the local level.

4) The lag between the delivery of technology resources and the start of activities, given the time needed between the formulation of an investment project and the final installation of the equipment (nine months).

Conclusions

The application of HTA is important in Chile, especially since the country has already established its 16 health priorities for the population,[6] one of which is eye care.

This is one of the first experiences of the ETESA Unit, and the first conducted to assess the health system's organization and participate in the proposal of an alternative solution.

The inclusion of this topic as a Round Table discussion in the international workshop that led to the establishment of the HTA Unit may have helped to facilitate subsequent joint work among some of the actors involved (notably the Ministry of Health and the Chilean Society of Ophthalmology).

The systematic search for information on ophthalmologic primary health care has made it possible for us to adopt the global approach necessary for solving eye health problems, in the use of both low-cost basic diagnostic technologies and those of greater complexity.

The establishment of the ETESA Unit within the Investments Division of the Ministry of Health seems to have facilitated dissemination of the recommendations and influenced decision-making with regard to investments.

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TABLE 4: PRIMARY CARE ROOMS EQUIPPED FOR DIAGNOSIS OF REFRACTION DEFECTS, 1998–1999

Health Services	C.G.U.	CESFAM
Iquique		1
Valparaíso-San Antonio	2	1
Viña del Mar-Quillota	2	1
San Felipe-Los Andes	1	
Concepción	2	
Talcahuano		1
Bío-Bío		1
Ñuble	1	
Arauco	1	
Araucanía Sur		1
Valdivia		1
Llanchipal		1
M.Oriente	1	2
M.Sur	3	2
M.SurOriente	1	3
M.Occidente	2	2
M.Norte	2	
M.Central	2	
TOTAL	20	17

CESFAM : Family Health Centers. CGU : Urban general practitioner's officess.
M: Health services in the Metropolitan area

TABLE 5: QUANTITATIVE EVALUATION PLAN FOR TREATING PRIMARY CARE REFRACTION DEFECTS, IV QUARTER 1998

No. Participating Health Services	14
No. Participating Communes	50
No. Rooms with Primary Care Equipment	37
Goal – 1998	36,000
No. of Patients Treated (*)	30,173
Achievement of Goal	83.8%
No. of Glasses Provided (**)	28,760
No. of Referrals Registered (**)	1,292
Referrals Registered	12.9%
Consultation Savings Most Often Noted (Usd)	10
Savings Most Often Noted in Glasses (Usd)	14
Operational Transfer Expenditure (Usd)	844,864
Capital Spending 37 Rooms (Usd)	873,977

(*) Ophthalmologic consultations conducted at the regular secondary care level are not included.

(**) Information for some services is incomplete.

1.5 Use of Routine Laboratory Tests in Primary and Secondary Health Care in Cuba[vi]

Background

In Cuba, the need to improve health services for the population calls for greater integration of the resources of the National Health System (SNS). The Ministry of Public Health (MINSAP) is responsible for applying the findings on methodology and practice contained in the Health Service and Health Technology Assessment, which can contribute to the development of appropriate policies, to ensuring the availability of resources, and to decision-making at all levels.[1]

In this regard, a process coordinated by the National Department of Health Technology Assessment of MINSAP was launched, with specialists from all over the country giving their views on the possible technologies to be assessed. Based on this approach, a total of 243 proposals were formulated, which had to be prioritized in order to proceed to their immediate evaluation.

Among those prioritized was the "use of routine laboratory tests in primary and secondary care,"[2] in light of the fact that clinical diagnosis is one of the areas of greatest and most rapid development at the international level, and the emergence health technologies in this field without the proper evaluation is becoming increasingly common. The rapid progress in all sorts of diagnostic methods and analytical techniques poses a challenge to health professionals who do not always possess accurate information on the different technologies, their characteristics, and their potential and real application in the field where they are to be used.[3]

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DESCRIPTION OF THE PROBLEM

Conservative estimates put the number of laboratory tests done in Cuba every year at approximately 130,240,000. This estimate includes only the tests considered essential, that is, those most commonly conducted in the practice of medicine at the offices of family doctors, polyclinics, and general hospitals. For well-known reasons, these tests are one of the practices with the greatest impact on health systems throughout the world.[4]

In the 1980s, no less than US$5 million per year was spent by the Cuban SNS in this activity for imports of raw materials alone. To this must be added, the costs of manufacturing and finishing in national industry, distribution and storage, procurement, maintenance, and the replacement of equipment, and the costs related to the time spent in the realization, distribution, and interpretation of the tests. Although the economic crisis during the first half of this decade has had a negative impact on the health situation and services and has resulted in a reduction in testing of this nature, spending in this area remains considerable.[5]

Therefore, at present, the following tests are done annually in Cuba: 10 million hemoglobin, hematocrit, and blood glucose counts; 50 million alkaline phosphatase tests; 5 million leukograms and erythrosedimentation tests; and 2 million cholesterol screenings and 100,000 HDL and LDL, with a positivity index for some high-level laboratories of some 30%-40%, and for some health areas, from 15% and 20%. Such low positivity percentages with such marked variability suggest a high degree of incorrect readings. It has been estimated that at the national level, the total number of incorrect readings with this type of test can translate into some US$2.5 million in expenditures of questionable effectiveness, a factor that is particularly significant given the country's current economic difficulties.

In light of the foregoing, the National School of Public Health (ENSP), in coordination with the Department of Health Technology Assessment of the National Directorate of Science and Technology of the Ministry of Public Health, decided to do a comprehensive assessment of the organizational system that serves as the foundation for the clinical laboratory services. To this end, a decision was made to examine the patterns of a group of selected indicators in terms of structure, process, and outcome at primary care centers and at the surgical/clinical hospitals of Ciudad de la Habana and the province of Las Tunas.

METHODOLOGY USED FOR THE ASSESSMENT

Descriptive research was done during the first quarter of 1998 in order to evaluate aspects related to the structure, process, and outcomes of clinical laboratory services for primary and secondary care in the provinces of Ciudad de la Habana and Las Tunas. The universe consisted of the clinical laboratories in the 81 health areas of the 15 municipios of the province Ciudad de la Habana and all the services of this specialty in the hospitals of the province. The health areas were organized by municipio, with the principal emergency polyclinics (PPUs) being excluded, and a simple random sampling was done for the selection of an area in each. Thirteen polyclinics were included in the study, and four PPUs were selected using a similar procedure. Nine surgical clinical hospitals were selected. The surgical clinical hospital, one polyclinic, and the PPU were evaluated in the Province of Las Tunas. The assessment criteria are summarized in the table 6.

Then, based on expert opinions, the indicators associated with these criteria were constructed and guides for gathering the information were prepared, using a variety of techniques: surveys, observation, and document review. Given the impossibility of evaluating the index of positivity of all the diagnostic techniques, the following tracers were selected, taking into account the frequency of indication: blood glucose, creatinine, transaminase, and cholesterol in the area of blood chemistry; hemoglobin, hematocrit, and leukogram with differential, for hematology; and direct and concentrated stool samples for parasitology. This latter in primary care only.

Surveys were conducted of patients seeking specialized care, patients entering hospitals, and those who went to PPUs. Laboratory workers and physicians from the different services were surveyed. Once the criteria and indicators had been selected, a workshop was held with the Chiefs of the clinical laboratories of the units selected. The workshop was attended by experts and group chiefs in the specialty at the provincial and national levels, which made it possible to reach a consensus on the standards to be applied, to establish the coordination necessary for the realization of the project, and to guarantee acceptance of the results. All the instruments were validated through their application in units that were not part of the study.

In order to assess the medical indications in the hospitals, the clinical histories of asthmatic and diabetic patients who entered during the first

quarter of the year were reviewed to determine the correlation between indications and the positivity of the results obtained from each diagnostic tool selected as a tracer in the study. The scales of values established for each unit in the aspects evaluated, based on the number of indicators that met the standards, were:

a) process indicators:
   - *Good:* more than 80%; *fair:* 60% to 79%; *poor:* less than 60%.

b) results indicators:
   - Positivity of the tracers: *Good:* 40% or more; *fair:* 25% to 39%; *poor*: less than 25%.
   - User and worker satisfaction: *Good*: 90% or more; *poor*: less than 90%.

RESULTS

At the Polyclinics and PPUs:

As seen in table 6, the guidelines for evaluating the process referred largely to the speed of delivery, the quality of care, and internal and external quality control. All polyclinics and PPUs were rated *good* in Ciudad de la Habana, while Las Tunas did not receive this classification because of the lack of external quality control.

With regard to results, only two polyclinics had a positivity of over 25% in all tracers, with great variability in the units studied. The worst was the polyclinic in Las Tunas, with a positivity of 6.1%. At the PPUs, it was 65%, which suggests higher technical standards than in the polyclinics. This can be linked to the fact that the patients seen in the PPUs are emergency cases, routine check-ups are not usually done there, and higher quality medical care is expected.

In 50% of the polyclinics and PPUs physicians expressed dissatisfaction with the waiting period for the results and with the fact that the province of Las Tunas does not have the necessary reagents in the service and cannot make accurate diagnoses. In only three polyclinics did the patients express *dissatisfaction* with the hours of operation and with delays in receiving results.

In the *analysis by tracers*, the readings of cholesterol (49.5%) and creatinine (41.9%) turned out to be above the established positivity standards. The leukogram and blood glucose readings are significant because they are the lowest figure obtained (12.2%) and (22.1%), both

considered *poor.* The hematocrit readings (27.6%) fell into the category *fair.* The percentage of general positivity was 37.6%.

In Hospitals:

The patients admitted to the hospitals studied expressed *dissatisfaction* with the laboratory services, among other reasons for the delay in obtaining samples (55% of the patients surveyed) and the failure to do the tests on the day they were scheduled. In outpatient consultations, all the satisfaction variables were below the parameters established, in terms of both the structural conditions of the site where they are taken and the opinion of the waiting period for tests to be performed.

With regard to the *results*, the general positivity of the tracers turned out to be 32.3%, or *not good.* This same indicator by service shows that only the therapy service (52%) can be rated as *good,* since it exceeds the standard set (40%), while the indicators corresponding to surgery, outpatient consultations, and drugs, were 34%, 26%, and 25%, respectively, and were therefore rated as *fair* and *poor.*

It should be pointed out that only the readings from three of the hospitals studied obtained a rating of *good,* since they had a positivity of over 40% (Calixto García Hospital, 40%; Juaquin Albarrán and Freire Andrades Hospitals, 46.6%). The rest were much lower than the established pattern; institutions such as the Salvador Allende Hospital (22.8%), the Manuel Fajardo Hospital (18%), the 10 October Hospital (17%), and the Enrique Cabrera Hospital (14.4%) were rated as *poor.*

In order to assess the quality of the medical indications, asthmatic and diabetic patients admitted in the first quarter were used as tracers. Their clinical histories were reviewed, looking for a correlation between indications and their positivity based on selected tracers; and diabetic patients were found to have a positivity of 51%, rated as *good,* a much higher figure than that for the asthmatic patients, for whom it was only 27%. The foregoing suggests that the indication from these tests of diabetic patients is more accurate than that for asthmatic patients, who perhaps do not need all the tests prescribed for them.

Dissemination and Impact of the Recommendations

The results of this work were discussed with all the Chiefs of the clinical laboratories in the units included in the study, which led to a consensus on a series of steps to improve aspects related to the structure, the process,

and the results, which will be evaluated later on with the aim of measuring the results obtained after their application.

Among the recommendations are medical training, the preparation of guidelines on clinical practices for each entity, the provision of worker incentives, development of the quality assurance system with emphasis on external control, improvement of the cost systems of units, full staffing of laboratories, and guaranteeing the existence of the necessary reagents.

CONCLUSIONS

This evaluation paper demonstrated that the quality of clinical laboratory services in the different units studied can be considered to fall between *fair and good,* depending on the indicators used. However, with regard to *results,* the evaluation yielded a rating between *fair* and *poor*, basically because of the low percentage of positivity of the tracers studied, the occasional lack of reagents, and the dissatisfaction of workers and users, which tends to be related to the accuracy and quality of the medical indications, and the time between the tests and the receipt of the results. In this regard, the best work was in the PPU and the intensive care services, which is probably explained by the profile of the patients who seek this service and because they are newly-created units.

Dissemination of the conclusions of this work led a series of recommendations, developed with the participation of the professionals more directly involved, the impact of which will be evaluated during the next phase.

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TABLE 6: ASSESSMENT CRITERIA

Structure	Process	Results	Satisfaction		Costs
			of Workers	of Patients	
Suitable sites	Delay in the processing of the specimens from outpatient consultations and wards	Hemoglobin, hematocrit, and leukcogram positivity	Job satisfaction	Satisfaction with the service	Outlay for salaries
All support material available	Delay in the processing of the samples at secure locations	Sgpt positivity	Recognition of work	Comfortable site	Training costs
All equipment available	Delay in the reception of the samples by unit of time established	Blood glucose positivity	Workload	Repeated drawing of blood	Cost of reagents
Equipment in good condition	Application of standardized techniques	Positivity of asthmatic and diabetic patients	Control and safety measures	Waiting period	Cost of treatment materials
Existence of records for keeping track of results	External quality control	Average no. of tests per patient		Time lag between the indication and the drawing	And of office materials
Full complement of technical staff	Internal quality control	Creatinine			
Technical staff working	Outpatient consultation Schedules	Cholesterol positivity			
Full complement of office staff	Scheduled rotations	General positivity			

1.6 THE REORIENTATION OF EYE HEALTH IN DOMINICA[vii]

BACKGROUND

The results of "The Barbados Eye Studies–Major Prevalence Findings" with regard to the eye health situation of the populations of the Caribbean are alarming. This study of citizens aged 40 to 84, found that 12% of the individuals examined had visual acuity lower than the normal limits. The leading causes of such alteration were cataracts and glaucoma. Opacity in the lens was found in 44% of all the people participating in the study, and glaucoma, in 7%.[1]

As is well known, all people over age 50 suffer from presbyopia, a defect of the vision that limits them in terms of work and their quality of life. Furthermore, through screening, refractive defects, a disorder that can severely diminish their visual acuity, with serious consequences for their learning and social development have been found in 15% of schoolchildren. Among workers, these defects can produce serious limitations in their job performance.

In order to avoid all these problems, they must be detected and corrected in a timely manner. Unfortunately, in many countries, there is not enough availability and access to eye health services, which is aggravated by the lack of health education or by traditional beliefs that limit the use of the existing services.

DESCRIPTION OF THE PROBLEM

Dominica is a Republic that belongs to the Commonwealth, with a population of roughly 71,000. English is the official language, and the literacy rate is 70%. Dominica is an agricultural country where the banana constitutes 47% of exports.[2]

Traditionally, eye health services in Dominica have been plagued by problems of ***availability and affordability***. For several years, the Ministry of

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Health (MS) has provided ophthalmologic care through foreign ophthalmologists, who must take long vacations to do this work, and whose ability to perform effectively is limited by cultural barriers. In addition, there have also been difficulties linked to the deficiency or obsolescence of ophthalmologic equipment and instruments for consultation, surgery, and special examinations. There has also been a lack of auxiliary personnel trained in primary eye care or to perform additional examinations. The only optometry service in the country handles refractive problems from the private sector. All of the above have greatly limited the availability of eye health services.[3]

Access to the service has not been a major problem, since, using public transportation, an individual can get from any point on the island in less than a hour and a half to the capital, Roseau, where the services are concentrated. *Affordability* has been very limited for patients with glaucoma, who must use expensive eye drops for life to control the disease. The retail price of these eye drops is close to US$13 for a 10ml flask, which, for a worker of average income, means spending his two days' income per month to purchase the medication. The cost to the MS is almost US$8 per unit. Furthermore, the *availability* of the drug is very limited.[3,4,5]

The *affordability* of treatment for refraction defects has also been limited, since eyeglasses have been provided exclusively by the private sector, and the cost of one optometry consultation and a pair of average-priced eyeglasses for a worker of average income were equivalent to 29 days of his income. The price of cataract surgery in the public sector was equivalent to 58 days of the average worker's income.[3,4,6]

Methodology Used for the Assessment

Assessment of the problems of *availability, access, and affordability* of proper treatment for the most common refraction defects in Dominica has been ongoing since the 1990s. It has been carried out by different international institutions at different points, together with the Ministry of Health. Studies on the *availability, access, and affordability* of basic eye care services (clinical examination, plus frames and lenses) were conducted by the Regional Eye Health Program of PAHO/WHO with Help the World See, Sight Savers International (SSI), Christoffel Blinden Mission (CBM), and the Caribbean Council for the Blind (CCB). Assessments of the ophthalmologic surgery services and special procedures have been done

independently by the Brenda Strafford Foundation and the Regional Eye Health Program of PAHO/WHO.[3,5,6,8]

Availability was defined as a comparison between the number of specialists in the country and the number required to meet needs. In order to establish the need for the correction of eye problems: i) the demographic composition was identified and estimated and internationally accepted prevalence for the Caribbean area in each age group was applied to that population. In addition, based on regional eye health policies,[7] the frequency of eye examinations required for the country's population was established; ii) the number of ophthalmologists and optometrists was determined, based on the assumption that they devote 100% of their time to the delivery of services over 220 working days per year and examine three patients per hour; iii) the existing capacity in hours was compared with the need in hours, based on the estimation described in i).

In the initial evaluation conducted five years ago in Dominica by the Regional Eye Health Program,[5] it was determined that the requirement in terms of basic care was 2.4 professionals devoted to basic eye care alone. On that occasion, a deficit in the *availability* of ophthalmology services was noted, since the provision of the service was intermittent, depending on whether or not foreign ophthalmologists hired by the Ministry of Health were in the country.

The evaluation of June 1998[6] showed that Dominica currently has four professionals (three optometrists and one ophthalmologist), which means that availability is adequate. (By way of reference, the United States has one eye health professional for every 5,200 inhabitants, while Dominica has one for every 17,700 inhabitants).

Accessibility in terms of travel time from the place of residence to the place of service using public transportation was considered adequate (travel time to the location of services less than 1.5 hours), although it can always be improved by bringing the services closer to the target population. In order to determine *affordability,* daily per capita income was used as the basis for comparison. A determination was made of the cost of the consultation, eyeglasses, and cataract surgery in the public and private sectors. Later on, an estimate was done of the number of days of income[4] that would be needed to obtain these services. In the case of Dominica, basic eye care (consultation plus lenses and frame) corresponds to 29 days of work for a person of average income. Cataract surgery

corresponds to 58 days, and a flask of timolol, to almost two days of income.

As an *indicator* of the performance of the services, a cataract surgery rate per million inhabitants per year was used. In the case of Dominica, the rate ranged from 500 to 800 in 1994, 1995, and 1996. In 1997, the rate reached 2,300, surpassing the goal of 2,000 per million inhabitants per year set for the Caribbean. In 1998, the rate continued to exceed the goal. The indicator is considered to reflect the impact of the various interventions since 1994.

Dissemination and Impact of the Recommendations

The recommendations pertaining to visits to and evaluations of the eye health services in Dominica were delivered to the Ministry of Health and the North American and European international agencies that provide assistance for eye health in the Caribbean. The Ministry of Health has also received visits from political figures during evaluations, and a number of sporadic visits from PAHO/WHO and the other international agencies.

Most of the North American and European agencies comprise what is called the "NGO Collaborating Group," together with the Caribbean Council for the Blind (a subregional NGO) and the Regional Eye Health Program of PAHO/WHO. The group developed a joint plan with the Ministry of Health[9] based on the recommendations of the various evaluations and visits. In addition to the funds provided by these agencies, the political visits have led the national authorities to assume a leadership role in the development of eye health services in the country.

In order to improve *availability,* the Ministry of Health asked the Brenda Strafford Foundation for assistance in training a Dominican physician in Ophthalmology in Ontario, Canada. The ophthalmologist returned to the country in September 1996 to work at the government hospital. The Ministry of Health also made arrangements to hire a Cuban optometrist to provide service at the same hospital. The operating room and the physician's offices were outfitted with the equipment necessary for making available all internationally accepted services, with assistance from PAHO/WHO and various international NGOs (SSI, CBM, and CCB).

Although *access* in terms of distance is acceptable in Dominica, the extramural programs launched in 1997 have optimized access by the entire population. These programs consist of weekly visits by the ophthalmologist to some of the six districts where the primary care system identifies people in need of ophthalmologic care. A vehicle is available for this program.

Affordability was improved with the production of eye drops in the country through a joint PAHO/WHO-Ministry of Health initiative, with technical and financial support from the CBM. The production laboratory was set up in early 1997 in the pharmacy of the Princess Margaret Hospital. Local production has led to a 100% to 500% reduction in the price of the various eye drops. The principal beneficiaries are people suffering from glaucoma who must use eye drops for the rest of their life.

Conclusions

The impact of the recommendations and technical cooperation is being reflected in the improvement of the availability, access, and affordability of services. The indicator utilized (rate of cataract surgery per million inhabitants per year) also shows that trend.

The evaluation of developments in the Eye Health Program in Dominica has served as a planning tool and a source of encouragement to the national authorities and international agencies.

The coordinated actions of the Ministry of Health, PAHO/WHO, and various international agencies and NGOs through the National Plan of Action[9] have had a significant impact not only on the mobilization of resources but on lobbying for eye health with the national authorities who have taken a leadership role in these efforts. If the levels of service production remain the same, in three years Dominica could be declared a country free of cataract-related blindness.

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1.7 THE COMMUNITY-BASED REHABILITATION STRATEGY (CBR) IN NICARAGUA[viii]

BACKGROUND

Numerous studies done in developing countries indicate that the prevalence of disability varies widely from one place to another. In the 1970s, WHO estimated that the prevalence of disability in the general population ranged from 7% to 10%.[1] In 1997, a study done by the Canadian Association for Community Living estimated the general population of Central America with some type of disability at 13% to 18%.[2] In Nicaragua, the estimate obtained by the standard of living survey coordinated by the Nicaraguan Institute of Statistics and Censuses was 12.12%.[3]

In Nicaragua, the first activities in the field of rehabilitation came about as the result of the poliomyelitis epidemic in 1959. In 1972, the disabled population increased due to the Managua earthquake. In the 1980s, the armed conflict led to an increase in the population with disabilities. In the late 1980s, the peace agreements resulted in the demobilization and repatriation of Nicaraguans, many of them disabled, who had emigrated to neighboring countries.

In the late 1980s, the Ministry of Health, with the technical support of PAHO/WHO, laid the foundation for a National Rehabilitation System, whose implementation was achieved with financial assistance from the Finnish International Development Agency (FINNIDA) in the early 1990s. The conceptual framework took account of the fact that for health, economic, and social reasons (disability not only affects the individual, but also his family, friends, the productive sector, and the community), priority should be given to comprehensive care for the disabled, and that the best strategy was community-based rehabilitation (CBR), since the delivery of rehabilitation services by the traditional model was insufficient to meet the growing demand for care. Since that time, rehabilitation has been a priority

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in Government health policies, a fact that is reflected in the 1991-1996 health plans and social agenda and in the constitutional reforms of 1995.

Description of the Problem

The Republic of Nicaragua is the country with the largest land area in Central America and has a population of over 5 million. The population is very young: almost 58% is under the age of 20, and 39.5% is between the ages of 20 and 64.[4]

Like the other countries of the Region, rehabilitation in Nicaragua began with a few health facilities (especially hospitals) with rehabilitation units modeled after those of the developed countries, which had not planning guidelines and provided coverage to only a small number of people (2%-3% of the persons with disabilities).[5] However, the increase in the prevalence of disability was creating a demand for care that, if addressed within the traditional model (building and equipping rehabilitation centers, training rehabilitation professionals, and providing up-to-date institutional treatment) would be very expensive, would take a long time, and would have difficulty meeting the demand for care. Furthermore, institutional-based rehabilitation permits little involvement by the communities in which the people with disabilities live. Incorporating the family and the community into rehabilitation activities makes it possible for treatment to be successful, since it fosters recognition of the fact that the disabled have the same rights as other members of the community.

It has not been easy to change ways of working that have been institutionalized for years in the health sector. The concept of CBR is closely related to that of primary health care. CBR implies identifying actions aimed at reducing the effects of disability and permitting the social integration of the disabled. These actions must be explained coherently to the disabled, their families, the community, and society, based on the principles of universality and equity. Therefore, the disabled and the community in which they live must be involved in the planning and implementation of rehabilitation activities and services.

Implementation Strategy

From an operational standpoint, CBR has three fundamental aspects: a) it focuses attention on active community participation; b) it uses simple technology: it applies standard case management to the community; it uses artisans to make adaptive equipment, such as crutches, parallel bars,

assistive devices, chairs, etc., from scrap materials or another materials available in the environment; it focuses on adaptations or modifications to houses and the community in order to guarantee access; and involves teaching physical therapy to community and family members; c) it utilizes public service systems.[6,7]

In 1992, the Ministry of Health proceeded with the organization, training, supervision, and control of pilot projects for community rehabilitation activities in the Integrated Local Health Systems (SILAIS) of Nueva Segovia, Madriz, Estelí, Granada, Bluefields, Chontales, Matagalpa, and Managua.[8] PAHO/WHO facilitated the information and required technical assistance, as well as the necessary supplies. Later on, financial assistance provided by Finland through FINNIDA made it possible to execute the project. The activities have been carried out by the central and operational levels and cover the areas of teaching, administration, organization, and management.

At the central level, the initial work covered: i) the philosophy behind the model of care and its integration into the Comprehensive Local Health Systems; ii) planning and execution: design of the training courses for professionals; selection of human resources; printing of the Manual on CBR and of surveys; procurement of teaching resources; procurement of the means of transportation; and other areas.

Later, the following activities were carried out: i) sensitization of the sectors involved (intrainstitutional, interinstitutional, and the community in general); ii) formation of departmental, regional, and local interinstitutional rehabilitation commissions; iii) selection of the communities; iv) selection of health agents by the local rehabilitation commissions; v) training of health agents as local supervisors; vi) detection and confirmation of difficulties using the CBR manual; vii) monitoring and evaluation based on the standards. The training of resources covered: i) professionals (formation of the rehabilitation teams responsible for the planning, execution, and monitoring of actions at the institutional and community levels), ii) health workers (phase I, training and surveys; phase II, validation and selection of notebooks) and, iii) community leaders (through workshops to raise awareness).

Furthermore, there was a strong community mobilization component: the CBR strategy was promoted in the communities selected through workshops.

The main problems encountered in implementation were: A) institutional in nature, as a result of: i) resistance to incorporating a new model involving community action and excessive emphasis on the traditional approach to disability; ii) the lack of human and financial resources, iii) lack of regularity in the work of local supervisors, who do not receive a salary and have to juggle their volunteer work in the community with their jobs; B) difficulties with the families linked to: i) a fatalistic attitude toward disability; ii) low levels of education, which limits the desirable outcomes; iii) the difficult economic situation faced by families, which limits the time available to care for members with disabilities; C) difficulties in the community linked to: i) cultural factors that make it difficult to have a true understanding of the problem of the disabled; ii) lack of urban planning, which limits CBR activities; iii) social violence; D) difficulties with the disabled as a result of: i) the etiology of the disability, since an acquired disability and a congenital disability are not one and the same (in the first case the person seeks privileges, and in the second he accepts his disability as an act of fate); ii) rejection of the person with a disability by the community; iii) limited incorporation of the disabled in the productive sector.

Monitoring has made it possible to reorient activities to raise awareness among workers in the health sector and the community and to transform the traditional concept of disability and rehabilitation, with emphasis on the dissemination of information.[9]

Assessment of the Impact of the Strategy

By implementing the CBR strategy, the participating institutions have organized mechanisms for the care, control, and monitoring of individuals with disabilities. This has meant the involvement of sectors outside the health area, such as: the Ministry of Education, the Ministry of Labor, the Ministry of Family, the Social Secretariat, Mayoral offices, and NGOs; the most tangible expression of which has been the fact that institutions such as those mentioned above formed the CBR Interinstitutional National Commission in 1992.

Civil society and communities have organized themselves to defend the rights of people with disabilities. In this regard, 40 local (municipal) rehabilitation commissions have been formed. Eight SILAIS initiated the CBR experience in 1992; their numbers have now grown to 16. In 1995, the National Assembly approved Law 202 on Prevention, Rehabilitation

and Equal Opportunity for People with Disabilities, an instrument that defines the roles of State structures and assigns responsibilities to them through the creation of the National Rehabilitation Board, on which the organizations for and of individuals with disabilities are represented. Furthermore, professional human resources education in rehabilitation has been systematized. From two rehabilitation services in the country in 1992, the number rose to 23 in the departmental hospitals and to 36 first level physiotherapy units in 1998 (in 1992 there were none).

The number of medical consultations at the first level of care increased from 0 in 1990 to 34,096 in 1998. During this same period, 8,000 disabled people have joined the workforce, and steps have been taken to integrate children with disabilities into regular schools (for example, children with hemiplegia, cerebral palsy, delayed psychomotor development, epilepsy, etc.).[10] Activities at the third level of rehabilitative care have been strengthened with the renovation of infrastructure and equipment. The Aldo Chavarría Rehabilitation Hospital (third level of care) has been remodeled and equipped, and its human resources trained. This hospital is the national training center for physiatry. The physical medicine and rehabilitation services were also remodeled and outfitted, along with those of the Lenin Fonseca Hospital in Managua and the hospital in the city of León. The referral and counterreferral system has contributed to an adequate distribution of resources by level of care.

Support for this process has been obtained from international NGOs such as HANDICAP INTERNATIONAL, implementing the CBR strategy in Chontales and its municipios in conjunction with the organized communities. The same work is being done by another NGO, IMPRHU, in Nueva Segovia and Estelí.

Conclusions

The approach adopted by the health authorities of Nicaragua is that the purpose of comprehensive rehabilitation is to reduce the impact of disability, and that to achieve this, direct actions on the part of the health sector are not enough. Harmonious intersectoral work by all governmental and nongovernmental organizations is necessary to structure and expand the services provided to the population with disabilities, promote health, and prevent disabilities. In this regard, emphasis is placed on the actual participation of the disabled, their family, and the community. CBR has proven to be one of the most expeditious ways of achieving this objective.

In 1998, the Ministry of Health formulated the National Rehabilitation Plan, based on the development of Integrated Local Health Care Systems (SILAIS) to increase activities aimed at disability prevention, rehabilitation, and equal opportunities for individuals with disabilities, within the context of a comprehensive approach to care that is part of national health policy. Evaluation of the experience gained in previous CBR implementation facilitated the formulation of the Plan.

Rehabilitation work in Nicaragua has regained momentum thanks to a comprehensive multisectoral model that combines the work of governmental and nongovernmental organizations on the problem of persons with disabilities, with technical support and external financing. This model is beginning to produce positive results although it also faces limitations and problems.

Although it is not a formal FINNIDA financing requirement, the periodic assessment of the results achieved and problems encountered, as well as adequate dissemination of the conclusions and recommendations derived from that evaluation are proving to be a useful tool for decisionmakers, professionals, and the community as efforts are made to continue on the path chosen.

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SOME CONCLUSIONS 2

1) Since the start of this decade, the majority of the countries in LAC have been engaged in or considering the launching of processes to reform their health systems and services. These processes are aimed at promoting equity in health and in access to services, increasing efficiency in the allocation and management of resources, improving the effectiveness and quality of care, ensuring financial sustainability, and promoting community participation and intersectoral action. Despite the importance of Health Technologies in terms of effectiveness and expenditure, and of Health Technology Assessment in terms of effectiveness, quality, efficiency, and sustainability, the topic was not specifically mentioned in the Plan of Action of the I Summit of the Americas (Miami, 1994). Furthermore, in 1995, during the Special Meeting on Health Sector Reform, organized jointly by PAHO/WHO, IDB, and the World Bank, with the exception of drugs, the subject of HTA was not cited as a priority. A recent world survey, moreover, showed that of the 103 public and private organizations devoted to HTA identified in 24 countries between 1994 and 1995, only one was in LAC.

2) Since that time, **the situation has slowly begun to change.** Thus, the II Summit of the Americas (Santiago, Chile, 1998) gave PAHO/WHO the mandate of developing and implementing the "Health Technologies Uniting the Americas" initiative. This initiative has three components: providing access to quality drugs and vaccines, strengthening information systems and monitoring in health, and improving to drinking water and basic sanitation services. Furthermore, the Plan of Action of the Summit expressly included the recommendation that the countries develop mechanisms to evaluate the safety, efficacy, effectiveness and cost of the technologies to be introduced in order to address these and other pertinent problems related to health. In addition, some countries (for example, Chile, Cuba, Argentina, Mexico, Panama, and Colombia) have launched initiatives aimed at strengthening the capacity of the health authorities in this and other fields that may be developed in the near future. The collection of cases presented here is also a good sample of this.

3) As the first three cases included in this collection show, biomedical equipment evaluation and, most particularly, technical assistance prior to purchase (or acceptance of the shipment, in case of donations) and installation of this equipment can be a substantial part of HTA application in the Region. This activity extends to technical assistance on operating conditions during life cycle of the equipment and establishes close links between HTA and the **"Biomedical Technology Management."** In this area, the joint work of managers, end users of the equipment (usually physicians), and other professionals who work in the sector (particularly engineers and medical physicists) is essential in terms of effectiveness, quality, and efficiency. In the same way, it is important the promotion by the countries of the training of biomedical engineers and technicians.

4) The common thread linking the following four cases is that they pertain to experiences related to the redesign of **organizational conditions** where one type of technology (or a set of closely related technologies) is developed. In the case of Chile and Cuba, the principal effort in the assessment was under the responsibility of national professionals working in recently formed HTA units. In fact, they were the first two assessments done by these units. In the case of Dominica and Nicaragua, the effort was largely the responsibility of the regional PAHO/WHO advisers for each specific field. In at least three cases, the recommendations obtained from the assessment were adequately disseminated and were used to make decisions to modify the existing organizational model. This shows the close link between many HTA applications and the field of health services research/evaluation.

5) In six of the seven cases, considerations pertaining to the prevalence of the problem that HTs try to address, their effectiveness, the impact of HTs on technical quality and the patient's perception of quality, the cost of the problem, and/or the HTs in question were taken into account when the decision was made to undertake the assessment. Furthermore, in all cases, the organizational and/or political implications of the recommendations were also considered. Specifically, the contributions of HTA to technical quality are very well reflected in cases 2, 3, and 5, and this confirms that this is an area of great opportunity for joint work among professionals interested in both disciplines.

   In any case, the foregoing is consistent with the **criteria** suggested in the literature **for prioritizing** such assessments and forms part of

the basic criteria that should be considered when planning programs, actions, and services, including plans for investment in health.

6) In six of the seven cases, the **national authorities** quickly understood the importance of carefully evaluating the technologies involved and supported this task. In Panama, support was provided for training a biomedical engineer overseas and his return to the Santo Tomás Hospital. In Honduras and Dominica, adequate coordination among the different actors involved was guaranteed. In Chile and Cuba, the recently created HTA units were promoted and sustained. In Nicaragua, community-based rehabilitation was included on the social agenda and in the priority health policies of the Government.

   Only in one case did the political instability of the country and the lack of financial resources prove to be decisive both in terms of the effectiveness of the technology evaluated and the conducting of the evaluation itself. This case illustrates clearly the need to carefully evaluate the political and organizational contexts in which the technologies will be applied, including the existing human resources situation.

7) In all cases, the role of **international technical cooperation**, especially that of PAHO/WHO, was important: in the case of Chile and Cuba, in promoting the formation of the units that carried out the work; in the case of Haiti, Honduras, Nicaragua, and Dominica, through the regional advisers of the Division of Health Systems and Services Development; and in the case of Panama, in the training of a biomedical engineer.

   In addition, the role of other financial and technical cooperation agencies should be pointed out. In Panama, the biomedical service of the Santo Tómas Hospital could not have been strengthened without the assistance of Project Hope. In Honduras, the role of the Government of Japan, a multinational company, and of the Catalonian Institute of Oncology was critical. In Nicaragua, FINNIDA has been financing a substantial part of the program. And in Dominica, several North American and European NGOs working in collaboration and the Caribbean Council against Blindness played a major role in the evaluation.

ANNEX

HEALTH TECHNOLOGIES ASSESSMENT IN LATIN AMERICA AND THE CARIBBEAN: PROTOCOL FOR THE COLLECTION OF PRACTICAL CASES

BACKGROUND

The **Sectoral Reform processes (SR)** under way or being considered in the majority of the Latin American and Caribbean countries (LAC) offer an opportunity to apply the knowledge derived from Health Technology Assessment (HTA) to strengthening the steering role of the health authorities and to improving the performance of health systems and services in at least five critical areas, in order to provide: i) a more equitable allocation of resources, ii) a better definition of the benefits provided under public and private insurance schemes, iii) a more solid foundation for the standards and rules of best professional practice and, as a result, an improvement in quality, iv) impetus to the dissemination of the most cost-effective HTs, v) a heightened culture of assessment and awareness of the need to have the best available evidence for decision-making that involves professionals, managers, users, and policymakers.

In addition, the **II Summit of the Americas** (Santiago, Chile, April 1998) included a chapter on Health Technologies (HTs) in its Plan of Action. In it, proposals are formulated for the proper application of existing technologies and the development of new technologies to improve and/or strengthen the supply of drinking water, basic sanitation, and solid waste management, information systems, and surveillance of health, drugs, and vaccines, telecommunications, and telemedicine. Furthermore, the Plan points out that mechanisms for evaluating the relevance, cost, and effectiveness of the technologies that are introduced in order to address these and other priority health problems will be developed. The Summit charged PAHO with providing technical assistance for the implementation of the recommendations in this field.

In this context, one instrument that can prove useful when emphasizing the implications of HTA in improving the equity, effectiveness, quality, and sustainability of health services systems, and in achieving the objectives

of the SR processes is the documentation, collection, and dissemination of a series of practical experiences (successful or not) pertaining to the application of HTA in several countries of the Region, as well as the lessons learned. There is some evidence that this can prove valuable in promoting HTA and can serve as an incentive for cooperation among countries in this field. Below, a simple methodology is proposed for summarizing and presenting case studies in this field.

TERMS OF REFERENCE

OBJECTIVES

General: Contribute to the promotion of HTA in the context of work related to health services systems, including the sectoral reform processes.

Specific: i) Prepare, publish, and disseminate a publication to be widely circulated containing 6-8 practical examples (successful or not) of the application of the basic concepts of HTA in countries of the Region and the lessons leaned, ii) begin the systematic documentation, review, analysis, and dissemination of practical cases related to HT and its evaluation in the countries of the Region.

WORK METHOD

Using the designated focal point in PAHO/WHO (HSO-HSP), it was requested that practical cases be referred to professionals working in sector institutions in the countries of the Region (including Headquarters and the PAHO/WHO Representative Offices) that work in the evaluation of the safety, efficacy, effectiveness, usefulness, and efficiency (cost-efficacy, cost-effectiveness, cost-usefulness, or cost-benefit ratio) of: i) equipment and medical devices, ii) drugs, vaccines, and other health products, iii) diagnostic, therapeutic, or rehabilitative procedures or, iv) their systems of organization and/or support (including the information systems).

The cases will be documented by means of the attached protocol, using a style that is at once concise and precise, avoiding unfounded conclusions and value judgments This information will be forwarded to the

focal point, who will assume responsibility for reviewing it, communicating with the authors, publishing, and final dissemination.

Publishing Guidelines

Originals will be prepared in an electronic file compatible with Windows 97, using Times New Roman 11 font, and 1.5 line spacing. They may include a maximum of 1-2 tables with no figures.

Deadline for Submission

The deadline for the receipt of cases for inclusion in the first edition of the publication ended on 15 December 1998. All cases received after that date are welcome and may be considered for inclusion in subsequent printed or electronic publications of the collection.

Focal Point

The focal point in HSO is: Dr. Alberto Infante:infantea@paho.org. PAHO Headquarters: 525 23rd St., NW, Washington, D.C., Room 620. Tel.: 1 202 974 3818, Fax: 1 202 974 3641.

Protocol for the Documentation of Cases

1. Background

A ½- to ¾-page summary will be provided of the historical, cultural, and/or organizational elements essential for an understanding of the problem(s) posed.

2. Description of the Problem

A ½- to ¾-page summary will be provided of the problem(s) posed (s), its/their importance in health, social, and economic terms; and when, by whom, and why a decision was made to do the HT assessment involved in addressing the problem(s).

3. Methodology Used for the Assessment

A 1-page description will be provided of how the problem was addressed; that is, of the initial questions, the evaluators, how they worked, how the recommendations were formulated, and what these recommendations were.

4. Analysis of the Dissemination and Impact of the Recommendations:

A ½- to 1-page summary will be provided of the methods for disseminating the report and/or the recommendations (approaches used, target audience, etc.). If possible, the impact of the application (or nonapplication) of these recommendations will be assessed.

5. Conclusions

A ½-page summary will be provided of the two or three main conclusions derived from the assessment process and the dissemination of the recommendations. Where appropriate, mention will be made of resistance and difficulties encountered during the assessment and/or the implementation of the recommendations.

6. Bibliography

If considered necessary, no more than 10 bibliographic references related to the case discussed can be included as footnotes. To this end, the publishing guidelines of PAHO/WHO, which appear on the last page of any issue of the *Pan American Journal of Public Health*, should be followed.

7. Authorship

The name(s) of the participant(s) in the development and/or compiling of the case will be included as a footnote on the first page. In addition, the name, position or post, and mailing and electronic addresses of the person who will act as focal point for the correspondence will be indicated.