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Vision and eye health care in developing countries

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Vision and eye health care in developing countries

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VISION AND EYE HEALTH CARE
IN
DEVELOPING COUNTRIES

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February 1981

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The authors wish to dedicate their efforts to the memory of Mark David Pearlman, a true humanitarian who was committed to his ideals, slain in El Salvador on January 3, 1981.

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I INTRODUCTION

In recent times there has been a movement toward improving health care on the international level. As part of that movement an increased awareness of the need for proper vision and eye* health care has arisen. Unfortunately, the facilities and mechanisms for providing adequate care have not always met the needs. There is nowhere that this lack of care is more obvious than in the developing nations. This paper will attempt to assess the needs and supply of vision and eye health care in Central America, describe their current delivery systems and present a method of planning for alternative delivery systems to improve the vision and eye health status of the population.

* We will use the definitions of "vision" and "eye" as put forth in B. Nižetić's chapter, Public Health Ophthalmology, from The Theory and Practice of Public Health, W. Hobson editor, Fourth Edition, Oxford University Press, London 1975 p.377: "Vision, here, is used in its full meaning, embracing the visual acuity for distance and nearness, central and peripheral visual field, scotopic and photopic vision, colour vision, depth perception (binocular vision)."
"Eye, here, is used as the expression of the whole visual apparatus (eye globes and annexes)."

II VISION AND EYE HEALTH CARE NEEDS IN THE DEVELOPING WORLD

1. General

The major causes of blindness in developing countries are trachoma, onchocerciasis ("river blindness"), nutritional blindness (xerophthalmia), cataract and accident related blindness.*

The World Health Organization (WHO) Programme Advisory Group of the Prevention of Blindness (February 1979) estimates minimum blindness prevalence rates in developing countries of 1.0% at a Snellen visual acuity level of less than 3/60 (in meters) or 20/400 (in feet) compared to a 0.2% rate at the same acuity level in developed countries. WHO generally regards the Snellen visual acuity level of 3/60 or less as blind, whereas legal blindness in the United States starts at 6/60 (20/200) best corrected Snellen visual acuity. At the 6/60 acuity level blindness prevalence rates are 1.5% and 0.3% in developing and developed countries respectively.

In onchocerciasis endemic areas, such as Chad, the blindness prevalence rate reaches 3.2%. In the trachoma endemic country of Morocco blindness prevalence reaches a high of 4.1% of the country's population.¹

Table I lists the categories of visual impairment adapted from the International Classification of Diseases, World Health Organization, 1977.²

*Detailed description of the four diseases and their development can be found in the appropriate sections of General Ophthalmology by Daniel Vaughan and Taylor Asbury, Lange Medical Publications, 1977.

TABLE I

CATEGORIES OF VISUAL IMPAIRMENT ADAPTED FROM
THE INTERNATIONAL CLASSIFICATION OF DISEASES,
WORLD HEALTH ORGANIZATION 1977

Category of visual impairment	Visual acuity with best possible correction		
	Maximum less than	Minimum equal to or better than	
LOW VISION	1	6/18* 20/70**	6/10 20/200
	2	6/60 20/200	3/60 (finger counting at 3 meters) 20/400
	3	3/60 (finger counting at 3 meters) 20/400	1/60 (finger counting at 1 meter) 5/300 (20/1200)
BLINDNESS	4	1/60 (finger counting at 1 meter) 5/300	Light perception
	5	No light perception	
	9	Undetermined or unspecified	

If the extent of the visual field is taken into account, patients with a visual field radius no greater than 10° but greater than 5° around central fixation should be placed in category 3 and patients with a field no greater than 5° around central fixation should be placed in category 4, even if the central acuity is not impaired.

*Metric System: The individual can see at six meters what a normally sighted person could see at 18 meters.
**Anglo System (Snellen): The individual can see at 20 feet what a normally sighted person could see at 70 feet.

2. Refractive Status in Central America

In attempting to assess the need for vision and eye health care in Central America it is necessary to look at the typical types of refractive and pathological conditions found in these countries. The vision and eye health needs of most of these nations, however, have not been determined, even at an estimated, non-scientific level. Therefore it was necessary to utilize data collected by the authors while working with Amigos de las Americas in Clancho, Honduras in the summer of 1979. This data is presented in Tables II and III. Clancho is a rural agricultural district of Honduras and this data may or may not reflect the typical vision and eye health problems found in the urban areas. It can be seen in Table II that most of the people who came to us were in need of low power converging lenses to compensate for hyperopia and/or presbyopia. Other authors^{3,4,5} have reported similar findings in other Central American and Caribbean countries. Of the people examined in Honduras 58.6% claimed to be literate. This indicates that more than half of the population may have some need for clear near vision. Whether literate or not, the large majority of women do all the cooking and sewing for the family and this type of work requires clear near vision.

3. Eye Health Status in Central America

Table III gives some indication as to the types of debilitating ocular conditions that are found in rural Honduras. The most important figure here is that 30% of the people seen had some form of ocular condition capable of causing severe visual impairment. Again, other authors^{6,7,8} have also re-

TABLE II

Distribution of spectacle prescriptions dispensed in Clancho, Honduras C.A. vision care clinics during June and July 1979 by R. Brooks and E. DeMayo. Correcting lens powers are given diopters. Note that percentages refer to percent of spectacles dispensed out of 739 total. 71.6% of the population seen (1032) needed a refractive correction.

minus	32	4.3%	4.3%
>0 ≤1 D	114	15.4%	59.5%
>0 ≤1 D with add	325	44.1%	
>1 D ≤2 D	57	7.7%	21.8%
>1 D ≤2 D with add	151	20.4%	
>2 D ≤3 D	3	0.4%	4.6%
>2 D ≤3 D with add	31	4.2%	
>3 D	2	0.3%	3.5%
>3 D with add	24	3.2%	

TABLE III

Distribution of types of ocular health problems observed in Clancho, Honduras C.A. vision care clinics during June and July 1979 by H. Brooks and E. DeMayo. A total of 311 or 30.1% of all patients seen had an ocular health problem. Categories with an incidence of less than 10 are together under "other." Included in the "other" category are xerophthalmia, uveitis, ectropion, enophthalmos, retinitis pigmentosa, strabismus, optic atrophy, and visually impairing ocular opacities.

pterygium	120	38.6%
cataract	111	35.4%
ocular trauma	18	5.8%
chorioretinitis (scars or active)	29	9.3%
glaucoma	11	3.5%
other	86	27.7%

ported similar types of ocular health problems in this region of the world. Specific blindness prevalence rates for Central American countries were not found in our literature search. The major causes of blindness in the developing world that are endemic in some areas of Central America were not highly prevalent at the authors' clinics in Honduras.

4. Political and Social Influences of Vision Care

The relation between good vision an/or health and the economics and politics of any country is quite ambiguous. Elling⁹ shows how medical care in general can be used both for the benefit or to the disadvantage of certain populations. It is reasonable to assume, at the level of the individual, that clear, comfortable vision could enhance the efficiency and sense of well-being of most any member of society, be it the child, student, farmer, laborer, or domestic worker. This enhancement could possibly be reflected in an increased productivity but to extrapolate this individual improvement to a national level seems presumptuous.

The recent literacy campaign and a future vision care program in Nicaragua exemplifies the possible political influence of vision care. The most obvious influence vision care could have is a positive association of eyeglasses and improved sight with the current political powers. Assuming that the vision care program will allow a previously unreachable population - that that is in need of a refractive correction in order to see small print - the chance to learn to read, further political implications can be derived

through the interactions of vision care, literacy and education programs. The director of the Nicaraguan literacy campaign, Fernando Cardenal, stated that, "For any education, the critical issue is that it prepares you for freedom. In the literacy crusade, we have started with an education for the peasant, which is the first step for freedom. This education implies a people who are free to criticize - who are taught the courage to criticize and to have their own thoughts."¹⁰

5. Summary

The above discussion presented data that, even alone, suggests that a significant need for vision and eye health care exists in many developing countries. The need for vision and eye health care could also be effected by political and social influences.

III CURRENT SYSTEMS OF VISION AND EYE HEALTH CARE DELIVERY

Vision and eye health care in developing countries can be divided into systems of delivery that are structured from resources obtained inside the country (i.e. "internal care") and those provided from the resources of other, usually more developed, countries, (i.e. "external care"). In the following sections we will describe various models of internal care and explain the functioning of agencies involved in the provision of external care.

1. Internal Care

A review of the literature reveals several different vision and eye health care delivery models in existence in developing nations. The most common is the ophthalmological (eye physician) model that is found to some extent in almost every country in the world.

Giles¹¹ defines two optometric worlds of vision care, 1) the English speaking model, characterized by the use of non-medical professionals, educated through many years of study, who perform eye examinations and supply spectacles, and 2) the Continental (European) model that utilizes an apprenticeship system and part time education, with an emphasis on craftsmanship rather than on refraction. The English speaking model is found in all English speaking countries as well as Ghana, Guyana, Panama, Jamaica, Kenya, Mexico, Nigeria, Philippines and the Virgin Islands. Both models are found in Argentina, Honduras, India, Singapore and Thailand.

Hofstetter¹² adds a third model of optometry, the

"Eastern" model, consisting of refractionists that are trained and hired by the optical industry. This model is found in Japan, Taiwan and Singapore.

Moss also describes an ophthalmic assistant model as a group of ophthalmologist trained assistants that provide refractions and technical aid. This model is found in India, Sudan, and the Republic of Korea. Also described is a "self-trained" group who perform basic eye tests and sell spectacles in the Middle East, Asia, and Africa.

Although the English speaking model of care delivery exists in Central America its extent is limited almost exclusively to urban areas. The authors' personal experience in Honduras reveal that the "self-trained" spectacle sellers and external vision care agencies, as well as "over-the-counter" purchase of spectacles, provide the majority of rural and urban care.

Table IV consists of information taken from a survey done in 1977¹³ that shows the number of vision and eye health care providers in many developing countries. The study makes no mention of the distribution of providers within countries.

2. External Care Agencies

Dozens of private organizations throughout the world directly or indirectly help provide vision and eye health care to the peoples of developing nations. The majority of these agencies are based in developed countries where health care resources are relatively plentiful. To some of these organizations vision and/or eye health care programs represent only a portion of their activities for promoting health care

TABLE IV

Numbers of vision and eye health care providers and demography in selected developing and developed countries from a 1977 survey by Moss, Maslovitz, and Yee. Data in this table was obtained from authentic sources and reliable persons in the international field.

COUNTRY	OPHTHAL- MOLOGISTS	CPTC- METHISTS	DISPENSING OPTICIANS	POPULATION (MILLIONS)	POPULATION PER PROVIDER (THOUSANDS)
AFGHANISTAN.....	12.....	2.....	12.....	19.800.....	636.7
ARGENTINA.....	1,500.....	450.....	2,400.....	25.720.....	5.9
AUSTRALIA.....	460.....	875.....	770.....	13.640.....	6.5
GHANA.....	6.....	11.....	10.....	10,000.....	370.4
GUATAMALA.....	37.....	2.....	20.....	6.260.....	106.1
GUYANA.....	4.....	6.....	4.....	0.794.....	56.7
HONDURAS.....	12.....	6.....	8.....	2.765.....	106.3
INDIA.....	6,000.....	3,000.....	?.....	614.472.....	68.3
ISRAEL.....	250.....	320.....	100.....	3.591.....	5.4
JAMAICA.....	4.....	12.....	1.....	2.098.....	123.4
MEXICO.....	800.....	3,200.....	?.....	63.574.....	15.9
NEPAL.....	10.....	4.....	16.....	12.570.....	419.0
NIGERIA.....	50.....	50.....	?.....	79.759.....	797.6
PANAMA.....	?.....	48.....	5.....	1.670.....	31.5
PHILIPPINES.....	260.....	1,700.....	1,000.....	45.168.....	15.3
TURKEY.....	200.....	0.....	500.....	40.160.....	57.4
U.K.....	943.....	5,699.....	1,805.....	56.921.....	6.7
U.S.....	11,500.....	23,000.....	12,000.....	215.100.....	4.6

and technology in the developing world. Activities in external vision and eye health care can be divided into four program categories: a) direct support of vision care, b) indirect support of vision and eye health care, c) blindness prevention and treatment, d) education and rehabilitation of the visually impaired. Many agencies are involved in more than one category. Table V lists most North American organizations and identifies the type of activities which they support. Brief descriptions and addresses of these and other eye health and vision care agencies can be found in the Appendix.

a) Direct Support of Vision Care

Vision care is the optical correction of refractive or binocular anomalies of the eye as well as visual training of accommodative and convergence dysfunctions. Organizations providing this type of care are generally volunteer or charitable groups utilizing vision care professionals (i.e. optometrists) with other non-optometric volunteers assisting at periodic, temporary clinics. These clinics are directed toward providing vision care for the indigenous poor populations of developing countries both in rural and urban areas. Most of the direct support of vision care organizations screen and examine large amounts of people in short amounts of time by giving a very basic vision and eye health examination. These basic examinations usually consist of case history, far and near visual acuities, ophthalmoscopy, retinoscopy and/or subjective refraction, and spectacle prescription and dispensing.

An example of a professional organization involved in vision care in Central American countries is VCSH/ Inter-

TABLE V

Selected North American and world-wide agencies involved with vision and eye health care in developing countries and categories of care they are involved in. Categories, described in the text, are abbreviated as follows: direct support of vision care = VC ; indirect support of vision and eye health care = IS ; blindness prevention and treatment =BPT ; education and rehabilitation of the visually impaired = ERVI. Addresses and more detailed descriptions of each organization are listed with other agency descriptions in the Appendix.

AGENCY NAME	TYPE OF CARE
Afro-American Foundation for the Prevention of Blindness.....	BPT, ERVI
American Refugee Committee.....	VC, BPT
Amigos de las Americas / Houston, Ohio State and Pacific University Colleges of Optometry.....	VC
Brother's Brother Foundation.....	IS
California Mobile Optometric Clinic, University of California at Berkeley School of Optometry.....	VC
CARE/MEDICO.....	IS, BPT
Direct Relief Foundation.....	IS, BPT
Eye Care, Inc.....	BPT
Eyes for the Needy.....	IS
FOCUS.....	BPT
Helen Keller International.....	BPT, ERVI
International Association of Lions Clubs.....	VC, IS, BPT, ERVI
International Development Research Centre.....	IS
International Vitamin A Consultative Group/ The Nutrition Foundation.....	IS

TABLE V continued

<u>AGENCY NAME</u>	<u>TYPE OF CARE</u>
LIGA International.....	VC,BPT
Medical Group Missions.....	VC,BPT
Operation Eyesight Universal.....	IS,BPT
Partners of the Americas.....	ERVI
SEVA Foundation.....	BPT
Student Optometric Service to Haiti.....	VC
Student Optometric Service to Humanity.....	VC
Surgical Eye Expeditions International.....	BPT
University of Waterloo School of Optometry.....	VC
Volunteer Optometric Services to Humanity.....	VC
Volunteers for Vision.....	IS,VC
World Health Organization.....	ERVI,IS,BPT
World Medical Relief.....	IS
World Vision.....	IS,VC

national (Volunteer Optometric Services to Humanity). On the national level VOSH functions to appoint state chapter directors, help establish new state chapters and assist, encourage, and co-ordinate overall volunteer efforts.

This organization consists of thirty-nine state chapters in the United States. State chapters are organizations in their own right made up of volunteer optometrists, opticians, lay people, and, in many cases, medical doctors. The organization and location of projects are left up to each state chapter.

The objective in VOSH traveling to foreign countries is to take vision care, "to those who have no such care available and who could not afford it if it were available."¹⁴ The optometrists examine the natives of the area and prescribe eyeglasses for them. They also treat minor ocular infections and prescribe medicine for treatment of ocular disorders when necessary.¹⁵

Most VOSH missions have taken place in Central American and Caribbean countries. Participants pay all of their own expenses such as air travel, hotels and meals. Although VOSH chapters are not usually associated with any other organizations they generally work closely with service groups of the host country and indirect support agencies.

With adequate equipment and staff one optometrist can examine 50 to 100 patients per day. Mission sizes vary from state to state -- from as small as three or four to as many as 100 personnel. Missions generally last about one week.

b) Indirect Support Agencies

Many agencies have little or no involvement in direct implementation of health care or training activities but rather, support other private and government efforts to provide health care in developing countries. These so called indirect support agencies are able to provide educational, technical, and financial resources, as well as co-ordination information and personnel, to be used in developmental programs. Some of these agencies, such as the World Health Organization, are relatively large, world-wide, and highly recognized groups that are sometimes involved in both direct and indirect support programs. But most of the indirect support agencies are smaller foundations and volunteer groups. They usually have financial backing at hand and/or undertake fund raising campaigns and volunteer drives.

In general, indirect support organizations are finding and connecting agencies. They have the administrative and communicative abilities to get the right people in touch. These valuable tools can also be used to pass information relative to the co-ordinating of activities of a wide variety of resources for developing countries. This in turn helps make more efficient use of the efforts of governments, big organizations or small committees wishing to help make the world a better place.

A good example of an indirect support organization is the Brother*s Brother Foundation (BBF). This foundation is known for its "ability to perform with efficiency and innovative style to prevent or control epidemics, improve national nutrition levels, enhance health therapeutic facilities, or assist

in the aftermath of natural disasters, and provide useful texts and library books." 16

BBF's involvement in the vision and eye health care field includes solicitation of thousands of eyeglasses and eyeglass frames from corporate sources to be issued to patients after cataract operations or to correct other sight problems in the Caribbean, Bangladesh, Kenya, Guyana, and Nicaragua. They have recently begun to help the government of Nicaragua find refracting equipment and optometric personnel to train Nicaraguans to provide vision care in conjunction with a nation-wide literacy campaign. They are currently also working with the government of Guyana in finding resources for the establishment of a vision and eye health care program.

c) Blindness Prevention and Treatment

Organizations working in the area of blindness prevention and treatment usually target one or two of the four most prevalent preventable causes of blindness in the developing world. WHO designates these four causes of blindness to be 1) trachoma, 2) nutritional blindness (xerophthalmia and keratomalacia), 3) onchocerciasis ("river blindness"), and 4) cataract (a condition that is curable but not currently preventable). 17 All of these conditions are major causes of blindness in Central America.

Blindness prevention includes efforts to improve personal and community sanitation (as in trachoma control) and to improve nutrition (as in nutritional blindness programs) both before the onset and during the progression of a potentially

blinding disease process, as well as control of disease spreading insect vectors (as with onchocerciasis prevention). The treatment of blindness occurs after the fact and usually includes corrective surgical procedures with trachoma, nutritional blindness and cataracts. Treatment of onchocerciasis consists of a hazardous and complex chemotherapy.

Operation Eyesight Universal (OEU) is a small Canadian organization that has been providing blindness prevention and treatment in developing nations since 1963. As is typical of many charitable agencies OEU originated from Christian missionary programs, but now consider themselves interdenominational.

One and a quarter million dollars were raised in 1979 from six developed countries and several developing countries to fund eye health care projects in 14 developing nations. Those nations are located in Eastern Asia, the Middle East, Africa, South America and the Caribbean.

One of the major pieces of work that OEU promotes is the correcting of blindness through cataract removal. From 1963 through 1979 256,590 corrective surgical operations were performed. The majority of these were on cataract patients. OEU is also involved to a considerable degree in the prevention and treatment of trachoma and xerophthalmia.

Much of the delivery of eye health care by OEU is through a series of 23 eye hospitals in Asia, including the OEU Institute of Ophthalmology in Manipal, India that was responsible for training seven indigenous eye doctors during 1979.

One of the most successful ventures of OEU is the running of eye camps. Eye camps are one shot efforts that deal with

a multiplicity of of ophthalmic problems in rural or village settings. In an eight to ten day eye camp 3 to 4 thousand patients will be seen and 350 to 400 surgeries can be performed by ophthalmologists and OEU trained paramedics. Mobile eye unit vans supply equipment, surgical dressings, drugs and other material needed to conduct an eye camp. Camps are normally conducted in conjunction with service clubs, such as Rotary or Lions Clubs, that arrange for site location and support staff.

OEU's eye health care delivery in Peru is accomplished by the use of teams of trained paramedics that go into the villages of this mountainous country to identify various kinds of eye disease prevalent among the people. They then arrange for the people suffering from curable blindness to go to one of the hospitals in Peru for treatment of their eye problems. This particular program is in its infancy and is being evaluated to see if it would work well in other similar countries in South or Central America.

d) Education and Rehabilitation of the Visually Handicapped

Education of the visually impaired traditionally has used special schools for the blind where an academic education was taught through the braille system of reading. More recently education of the visually handicapped has included maximum use of any residual vision that most "blind" persons have, expansion of school curriculums to include courses that will prepare the student to function independently in their society and "mainstreaming" or integrating the blind or low-vision

student into regular schools by allowing a few hours a week of special instruction from a trained teacher of the visually impaired.

Rehabilitation of the visually handicapped is first concerned with developing mobility and physical independence. Integration of the visually impaired into the social and economic life of their community follows orientation and mobility training and deals with development of personal care, social interaction, and work activities.

The authors' search for information failed to turn up any descriptions of the existing programs for the education and rehabilitation of the blind in Central America. The following discussion will deal with Helen Keller International (HKI) because of this organization's leadership in the field of services for the blind. Although most of their work has been situated in Asian countries, the authors feel that their program methods could possibly be adapted and utilized in Central American countries.

HKI is a voluntary agency that has been working to combat blindness and eye disease for sixty-five years. Its exemplary work in the area of caring about the blind includes technical assistance to organizations and governments with their efforts to help enable visually impaired and blind persons to become useful and contributing members of the community. They also provide foreign consultants to help train indigenous personnel to do field work and take part in the evaluation of the project's effectiveness.

HKI has three major programs which have been functioning in India: 1) prevention of eye disease and blindness, especially among malnourished preschool children in developing countries. 2) education of blind and visually disabled children, and 3) rehabilitation of blind adults.

e) Summary

Vision and eye health care in developing countries is delivered by personnel and material resources that originate from both inside and outside the countries. The methods of care delivery vary considerably even within individual countries.

It should be apparent from the preceding discussion that external care is a highly utilized source of health care in developing countries, especially when compared to the minimal use of outside resources by developed nations.

IV INTEGRATED VISION and EYE HEALTH CARE PLANNING in DEVELOPING COUNTRIES

1. Introduction to Planning

It is commonly accepted that appropriate health care planning is essential to meeting the health care needs of developing countries.¹⁸ It should also be recognized that health planning is an objective and systematic process involving the gathering and analyzing of information and the organization of resources. The following section presents a planning structure for vision and eye health care that is based on a model developed by Carl Taylor.¹⁹ We have attempted, where possible, to relate planning as it may apply in Central America.

2. Planning Stages

a) Initial Planning

When planning a specific program or project (such as blindness prevention or vision care) within the health care field, one of the first steps should be to assess the current overall health care structure in the geographic location involved by collecting general information on existing facilities and personnel.

The first step in the planning process will require input from individuals knowledgeable in administration and economics as well as health and social sciences of the country or region involved in the planning process. The political power structure, including any central health agencies, must play a major role in any planning. National or regional health agencies may have important information and data about the major causes of visual impairment as well as having information on governmental

and non-governmental agencies involved in the delivery of health care. The extent and type of support provided by these various agencies should be assessed early in the planning process. Input from health professionals must also be sought and when dealing with eye and vision health care this may include several different professions (eg. ophthalmology, optometry, opticianry, ophthalmic assistance and ophthalmic technology) that deal directly with eye and vision health care.

Possibly the most important input is that which comes from the general public. Feuerstein²⁰ feels that in order to meet the needs of rural health problems in developing countries any program must be culturally aware and encourage self-help as fit into local and national objectives. WHO also regards the input of the general public as being very important and states: "Measures have to be taken to ensure free and enlightened community participation, so that notwithstanding the overall responsibility of governments for the health of their people, individuals, families and communities assume greater responsibility for their own health and welfare, including self-care."²¹ WHO also feels that governments, health professionals, and health agencies should actively seek out this input in order ". . . to ensure that people can participate individually and collectively, as part of their right and duty, in the planning, implementation and control of activities for their health and related social development."²² Some feel the most appropriate planning is geared toward helping local areas plan for themselves.²³

b) Policy and Goals

Along with community participation and cultural awareness the gauging and mobilizing of political opinion is another integral part of the planning process. Taylor²⁴ feels that the best way to gauge and mobilize political opinion is by forcing the policy making group(s) of the government involved to explicitly state their long and short term goals. This exercise can be used to educate the policy makers as to the importance of planning. Without knowing the general goals of the government any specific programs dealing with health care may totally miss the mark. The type of information that needs to be put forth in the goals statement includes: 1) what problems are to be attacked, for example, blindness prevalence rates, 2) the amount of change in the condition that is desired, 3) the time schedule for implementing the program and creating the desired changes, 4) who is to receive help from the program, and 5) what geographic areas are to be included in the program.²⁵

In addition to stating goals for the health program, overall national development policies must also be taken into consideration. It is important that all health care programs occur within the context of planned national development.²⁶

The effect of planned national development on vision and eye health care programs is exemplified in the current situation in the Central American country of Nicaragua. After the Sandinista overthrow of the Somoza regime in August of 1979 the new government began a massive literacy campaign that has as its goal to reach fifty percent or more of the illiterate populace. Functional illiteracy in some rural areas was

estimated at 75 to 80 percent of the population.²⁷ Attempts to increase the literate population has caused an increased need for clear near vision. Younger citizens with significant refractive error and older presbyopic citizens will require some form of spectacle correction for reading. The Nicaraguans have begun looking for help with regard to spectacles for their people. They have already made contact with the Brother's Brother Foundation (previously described) in hopes of receiving help in the provision of spectacles. The Ministry of Health in Nicaragua is currently working with the Brother's Brother Foundation and several U.S. schools of optometry to arrange a program that would send optometrist advisors and students to Nicaragua to help with refraction and spectacle distribution and, more importantly, help train Nicaraguans how to take charge of their own vision care. It will be of great interest to see what success Nicaragua has with this project and how it will fit in with other sections of the nations development, including their overall health care structure and the economic rebuilding of the country. It will be important for Nicaraguans to keep national policies and projects in line with each other.

WHO sees one of the major shortcomings of health services is the "Lack of clear national service systems with other components of national development."²⁸ In regard to eye and vision health care programs WHO states that "National programmes for the prevention of visual impairment and blindness should be formulated and implemented in co-ordination with the different ministries and departments, such as those for health, education, social welfare and labour, and with related institutions,

including voluntary and other non-governmental organizations."²⁹

c) Data Collection

When attempting to fit health and other related programs in with planned national development it is essential that appropriate data be collected on the social, physical and economic features that exist in the area where the plan is to be implemented. Information relative to the needs and demand for the particular program under consideration and what resources must be available to implement the program must be gathered.

In planning for vision care the assessment of the optical manufacturing industry is necessary. In countries where optical industries do not exist or are not extensive enough to supply the expected needs, possible external sources of optical goods must be determined.

After existing resources have been determined, assessment of the need for a given service or program should take place. Needs assessment is a complex task which should include the gathering of information on the number of people to be served and their demographic distribution and the frequency and distribution of health problems in the target population. For eye and vision health care this would include items such as blindness and refractive error prevalence.

Future needs and demands are difficult to assess in areas where care has been virtually non-existent because of what Schach, et al, refer to as the ". . . uncertainty as to the presence of a 'bottomless pit' of demand or need."³⁰ Despite the difficulties involved, an accurate as possible assessment of future needs and demands for care must be attempted.

Schach, et al, studying the use of vision services in several countries, looked at a few of the variables involved in demand for vision care. They found that people with higher education levels are more likely to seek out vision examinations. They also found that economics and perceived morbidity are more important variables in the use of vision services than is the availability of personnel.³¹ Even though it is not the most important variable, current and projected future supply of personnel as well as other resources such as facilities and transportation must be assessed.

It has been found that vision care providers in areas with low provider/population ratios render proportionally more examinations of vision than would normally be expected solely on the basis of the availability of their services.³² This fact tends to further complicate estimates of need for personnel.

In addition to gathering data on needs, demands, and resources, information on the economics of current and proposed programs must be collected and analyzed in terms of cost and benefit. Cost/benefit statements can be quite complex and usually contain many variables, some of which often have undeterminable benefits.* The possibility that less healthy conditions in developing countries helps to create a less efficient and productive work force which in turn slows

* The reader is referred to Michael Roemer and Joseph Stern's detailed discussion of economic analysis of projects, The Appraisal of Development Projects: A Practical Guide to Project Analysis with Case Studies and Solutions, Praeger: New York, New York, 1975

economic growth is an example of, at best, a difficultly and likely inaccurately determined variable.³³

d) Priorities

Appropriate and adequate data collection is essential in order to make appropriate statements of health and economic priorities. The means as well as the goals of solving health problems must be considered when establishing priorities. It seems obvious that unmet life-threatening health needs, malnutrition for example, should be a high priority item in a comprehensive national health plan. But the categorization of priorities becomes complicated when the interrelation of health problems and the vulnerability* of amelioration of these problems is considered. WHO claims that, "Two-thirds of all existing blindness would have been preventable through basic public health and nutrition measures."³⁴ This fact might allow blindness prevention a much higher priority in a health plan than it would otherwise merit because of its close relationship with life-threatening problems as well as its high vulnerability relative to other high priority health needs.

Another example of the interrelationship of variables involved in priority setting comes when trying to determine what level of type of vision or eye health care is to be provided in a country. For instance, vision care might be very important in a literate urban populace when compared to

* Vulnerability refers to the availability of technical resources to control certain diseases or conditions.

a rural population with high illiteracy and blindness prevalence. In this rural populace the need for a vision care program may be much lower than the need for an effective blindness prevention and treatment program.

Epidemiologists, administrators, politicians, the general public, and economists will all need to look at the problems and solutions of stating priorities from several different perspectives, comparing their wants and needs to the vulnerability of the health problem and its relationship to other health and non-health problems. Striking a balance between the various perspectives is the best planning strategy.³⁵

e) Outline of Alternatives

After listing priority health problems alternatives for dealing with those problems need to be examined. All alternatives must begin as improvements on existing systems of care because adapting these current health care delivery systems to meet as many objectives as possible is most often easier than totally restructuring the system.³⁶ The "status quo" in developing countries, especially in rural areas, is quite different from that found in the U.S. and other developed nations. Rural vision and eye health care is limited in the U.S. but this geographical maldistribution is much more pronounced in many developing regions. Due to the lack of access to and expense of transportation, care for many people in these rural areas is usually impractical and/or unaffordable. Another problem with current vision and eye health care in some developing countries is that it is provided for, to a large

extent, by unstructured and unorganized spectacle selling entrepreneurs.³⁷ This method of care is not standardized and most likely is not up to par with care delivered by well trained refractionists. It is probable that most of these spectacle peddlers never receive any training in pathology detection. Without the knowledge required to detect and appropriately refer pathologies these entrepreneurs will not fit into health care systems that emphasize referral to the appropriate level. Geographic maldistribution and insufficient training of vision and eye health care providers are only two out of many problems with the current care delivery systems in developing countries.

Alternatives and improvements for the existing models of vision care may be countless but they will almost certainly need to include one or more of the following:

- 1) increased organization and utilization of international agencies
- 2) development of auxillary vision care personnel
- 3) incorporation of vision care into existing health care systems
- 4) development of optometric profession

The lack of co-ordination between international agencies involved, both directly and indirectly, in vision and eye health care has led to duplication and overlap in some areas while other areas go unserved. These organizations are a tremendous care and technological assistance resource and should be utilized as efficiently as possible. Their most important contribution will most likely be in the rural areas where they can assist not only in direct care provision but also in the training of local personnel.

The training of auxillary personnel to provide primary health care, including basic eye health services, has been suggested by numerous authors.^{38,39,40,41,42,43} Schlossman explains his position by asserting that,

The relative shortage of highly specialized health personnel, and the necessity of an interdisciplinary approach to the basic problem of prevention of loss of vision, make obvious the need for a structural analysis of the situation and a search for new solutions. One of the solutions is the increasing use of allied health personnel (nurses, ophthalmic assistants, ophthalmic technicians, ophthalmic technologists, orthoptists, and pleioptists as well as optometrists) working as a team in the delivery of complete eye-health care, under the direction and supervision of the ophthalmologist.⁴⁴

WHO suggests that primary health workers should receive training in maintaining and promoting eye health, which should include routine testing for visual acuity, prevention, detection, and treatment of common eye infections, trauma and nutritional disease. Primary care health workers should also be trained to detect and appropriately refer more complicated problems for treatment at a more specialized level.⁴⁵

Local primary care providers should be given the opportunity and incentive for upward progress to higher positions or levels within the system.⁴⁶ Shehu states that it is important, ". . . that health workers in the rural areas have the opportunity for advancing their knowledge, ambitions and status within their respective functional roles."⁴⁷

Vision and eye health workers could be selected from spectacle peddlers, trained refractionists, opticians, local nurses, community health workers, or other qualified community members. The use of community health workers and local nurses

for vision and eye health care would be a step toward integrating this care with overall health care delivery systems. WHO supports this latter approach and sees as its central components the, "gradual integration of eye-health care activities into the system of basic health services in each country." and "comprehensive eye-health care which includes in a continuum prevention, cure and rehabilitation."⁴⁸ This type of vision and eye health care delivery system would need primary, secondary and tertiary levels of care equivalent to those existing for general health care delivery. This would allow sharing of facilities and personnel as well as helping to foster a more interdisciplinary approach to health care. The primary care worker, as discussed above, would be involved in detection and treatment of common eye diseases and would play a large role in blindness prevention by helping to educate people about prevention related to proper nutrition and personal hygiene. Secondary care should be provided by an ophthalmic assistant or the equivalent and, according to WHO, their duties should be, "1) To detect and treat simple eye diseases, 1) To take up simple surgical measures for entropions, trichiasis, pterygium and foreign body, 3) To test visual acuity, refract and prescribe glasses, 4) To guide health workers in the eye health care programme."⁴⁹ These secondary workers would work under the supervision of ophthalmologists or other medical officers involved in training personnel and providing tertiary level care. Tertiary level care would deal with ocular conditions beyond the scope of primary and secondary care.

In more remote areas mobile services may be needed to supply primary and secondary levels of care. ⁵⁰

If vision care delivery in developing countries is integrated with overall health care delivery systems it is likely that the level of care will improve especially in areas where vision care is currently provided by self-trained spectacle sellers. As the level of care improves so will the expectations of those seeking care. Those seeking care may begin to realize that there is more to vision care than just refraction and prescription of spectacles.

At the point where the demand for improved vision care goes beyond that which can be provided for by trained technicians Optometry could become an essential component of the health care delivery system. With the education and training in sensory and motor physiology, geometric, physical and ophthalmic optics, ocular anatomy and physiology, systemic and ocular pathology, orthoptics, contact lenses, low vision, and visual training optometrists offer the most advanced vision care available. Because of the extreme lack of simple refractive care and trained personnel most developing countries presently have little demand for advanced vision care. As the demand for "state-of-the-art" care develops so can optometry develop as a profession. Optometry will certainly take time to evolve in these countries just as it has in the U.S.. Training, at first, will most likely need to take place in some form of apprenticeship. This type of approach becomes impractical when training large numbers of professionals. The educational

institution combined with clinical facilities is seen to be more feasible.⁵¹ This may require sending students out of the country for training.

One way countries could cut expenses on developing educational institutions is through the development of regional universities serving several countries. No matter how or where this training takes place it must emphasize the interdisciplinary nature of health care. Public health optometry, which has been defined as, "the use of the full scope of optometric knowledge, skills, and services to prevent disease, to prolong life, and to promote health and efficiency of groups of people, particularly at the community level"⁵² must be stressed.

f) The Detailed Plan

Regardless of which alternatives and improvements are decided upon the next step in planning is to develop a detailed plan. This should include the setting of targets and standards for quality and quantity of performance over a specified period of time. Short term plans will need to be more detailed and less flexible than long term goals.

g) Plan Implementation

The next to last step in the planning cycle after the detailed plan is developed is implementation of the plan. Implementation must be considered as an important stage in health planning and not be considered as separate from the process of planning. Those who are responsible for the plan implementation, therefore, must have input into all stages of the planning process.

h) Evaluation

Evaluation is also an integral part of the dynamic process of health planning. There are four basic aspects to evaluation. They are⁵³:

- 1) appropriateness - is the program directed at an important problem
- 2) adequacy - is the program of proper size and emphasis to deal with the problem
- 3) effectiveness - how well is the program meeting the pre-established objectives
- 4) efficiency - how cost effective is the plan

Implementation and evaluation must not be thought of as being separate activities, i.e. implementation must include an evaluation process.

The next logical step for planning to take is to start the planning cycle from the beginning again. Information from the evaluation will function as initial data for the new planning and can allow for enlightened resetting of goals and priorities.⁵⁴

i) Summary

Planning how to proceed with the planning process will ultimately speed the planning and help implementation of programs. The data to be collected will be determined by the policies and goals set. Analyzed data will help in establishing realistic priorities and possible alternatives for reaching goals. Detailed plans can vary considerably in different countries even when attempting to solve similar problems. Implementation and evaluation must be incorporated together in the detailed plan in order to establish a reference for future improvement of development programs.

Various alternative methods of vision and eye health care delivery have been alluded to. We have refrained from developing a detailed plan because of the wide variation of circumstances in different countries. The purpose of outlining alternative delivery mechanisms is to establish that a variety of acceptable and reasonable routes for delivering widespread vision and eye health care at a low cost are possible and that these routes need not be patterned after delivery systems being utilized in developed countries.

V CONCLUSION

There is a need for vision care to be integrated into eye health care delivery in developing countries. Current programs tend to emphasize blindness prevention and treatment and neglect the problems caused by the physical and social debilitation and sometimes effective blinding caused by uncorrected refractive errors. In order to bring about an integrated vision and eye health care delivery system developing countries must utilize effective planning models and procedures.

Developed countries can more efficiently assist developing countries by co-ordinating external care agencies in data collection, care delivery and training programs.

It is easy to conclude that the vision and eye health care needs of people in developing nations should not be neglected. However, with the current limited supply of personnel qualified to provide such care most people have little or no access to the care they need. Students working with the Student Volunteer Optometric Services to Humanity (SVOSH) in Costa Rica during 1976 reported that 85% of the people they examined were receiving vision care for the first time.⁵⁵

The actual number or percentage of people in developing countries not receiving needed vision care is unknown. Isolated attempts at gathering data concerning the prevalence of vision defects are of limited usefulness. Compilation of larger amounts of refractive data in both rural and urban areas of developing countries will allow a more concrete assessment of the vision care needs of the peoples studied.

One way to compile a large base of refractive data on developing countries would be through the combined efforts of the external direct care agencies. Most of these agencies already determine the refractive status of a considerable number of people while delivering vision care. If this data were collected in a standardized manner and analyzed by a centralized agency a more complete picture of the vision care needs of the countries included in the study could be drawn.

The actual delivery of vision care by external agencies is not co-ordinated on the international level.^{56, 57} At the time of this writing there is no overseeing body that functions to inform organizations about who went where, when, thus making it possible to avoid a redundancy of services to certain populations. Such an overseeing or co-ordinating agency would enhance the effectiveness of external agency vision care delivery by allowing care to be distributed more evenly throughout high need areas thereby avoiding an over-saturation of care in some high need areas and a lack of care in moderate need or lesser known high need areas.*

The co-ordination of care delivery by external care agencies in developing countries would make it easier for these agencies to establish programs for the training of indigenous vision and eye health care personnel on a continuing basis. The effectiveness of implimenting WHO recom-

* The situation has been experienced by these authors and their colleagues where week long visits to very poor areas in rural Honduras were mistakenly made annually and this resulted in a very low utilization of the clinics.

mendations on the use of local indigenous personnel as field health workers, both in terms of usefulness and lowered costs, has been established by Helen Keller International.⁵⁸ Although these workers cannot provide the extensive and specialized services the highly trained professionals in both developed and developing countries can, their short, intensive training courses, field experience, and continuing education can allow them to provide adequate quality, functional care and rehabilitation to a population of visually disabled persons that might otherwise receive no care at all.

It is the hopes of the authors that vision and eye health care programs by external care agencies will keep as a fundamental principle that assistance to developing countries should be oriented toward creating a situation where these countries will be able to eventually plan and deliver care to their own people through the use of their own trained personnel.

Professor E. J. Fisher of the University of Waterloo School of Optometry tells the very appropriate old adage, " I saw a man who was hungry and gave him a fish. The next day he was hungry again. Then I taught him how to fish and he now catches some every day."

VI APPENDIX:

A partial list of agencies involved in the support of vision and eye health care programs.

Note:

The information contained within has been quoted or paraphrased from publications or correspondence from the organizations described or from the Helen Keller International publication, Blindness in the Developing World: A Background Paper, January 1980, pp 33-39. Incomplete information on some agencies is due to the lack of availability of information but was included to facilitate further efforts to complete the list.

1. Afro-American Foundation for the Prevention
of Blindness
4554 Circle View Boulevard
Los Angeles, California
2. Agency for International Development (AID)
United States International Development Cooperation Agency
Washington, D.C. 20523
(202) 655-4000

Dr Clifford A Pease, Deputy Director
Office of Health
Development Support Bureau

The AID is an indirect support agency that has been involved in the funding of international blindness organizations such as International Eye Foundation and Helen Keller International. AID has also helped fund an ophthalmic training program in El Salvador, an eye care training program in Honduras and a nutritional blindness prevention program in Haiti. Currently the agency's largest support activity is with WHO's onchocerciasis control program in Africa.

3. American Refugee Committee (ARC)
310 Fourth Ave. So., Room 410
Minneapolis, MN. 55415
(612) 332-5365

Glenn E. Nelson, Business Manager

The Medical Program of ARC is committed to helping provide health care to Cambodian refugees in Thailand. Their eye program staff of ophthalmologists and optometrists has, from late 1978 through 1980, performed 111 surgical operations, treated 9,500 eye disease patients and fitted approximately 12,600 refugees with eyeglasses.

4. Amigos de las Americas
5618 Star Lane
Houston, Texas 77057
(800) 231-7796 (713) 782-5290

John Sloan, Latin America Program Director

Amigos de las Americas organizes annual summer vision screening and used spectacle distribution projects that are implemented by North American optometry students with high school age assistants in Central and South America. This organization provides young US citizens the opportunity to raise money, travel to foreign countries and experience different cultures while assisting in health and technological

development. Other programs include dental health, immunization, veterinary and well digging projects.

5. Amigos Program
University of Houston
Central Campus
College of Optometry
Houston, Texas 77004

A student run vision care program to Central and South America in conjunction with Amigos de las Americas. See Amigos de las Americas and S.O.A. Amigos Committee for more details.

6. Amigos Project
Ohio State University
College of Optometry
338 W. 10th Avenue
Columbus, Ohio 43210

A student run vision care program to Central and South America in conjunction with Amigos de las Americas. See Amigos de las Americas and S.O.A. Amigos Committee for more details.

7. Brother's Brother Foundation
824 Grandview Avenue
Pittsburgh, Pa. 15211
(412) 431-1600 Telex- 866-195

Luke L. Hingson, Associate Director

See text pages 16-17.

8. California Mobile Optometric Clinic
University of California at Berkeley
School of Optometry
Berkeley, California 94720
(415) 642-5246

Dr. Newmeyer, Faculty

The School of Optometry at U. C. Berkeley has used mobile van clinics to provide care to underprivileged in California. In summer of 1980 students organized a two week screening, refraction and eyeglass distribution project in Guatemala, with co-ordination and in-country support from World Vision and spectacle collection by California Lion's Clubs. This was the first in a proposed annual international vision care program.

9. Canadian Int'l Development Agency
Place du Centre
200 Promenade du Portage
Hull Auebec KIA 064
Canada

10. CARE/MEDICO
660 First Ave.
New York, New York 10016

Len Coppold, MEDICO Program Officer

The MEDICO program has had medical volunteers, specializing in eye surgery, work in Tunisia and Algeria. CARE also conducted a Vitamin A supplement program in Madurai, India through a hospital there.

11. Caritas
Lowenstrasse 3
6002 Lucerne, Switzerland

Mr. Fridolin Kissling, Executive Director

12. C.E.R.P. Department de la Lingue Braille
Rue de l'Argonne 37
1060 Brussels, Belgium

Mr. Claude Schepens, Le Conseiller-Directeur du Centre

13. Christoffel Blindenmission
e.v. Nibelungenstr. 124
D - 6140
Bensheim 4, west Germany

Wolfgang Stein, Executive Director

A West German agency which operates in 58 countries around the world. Its emphasis is on the prevention of blindness and in the treatment of eye disease, but substantial attention is also paid to the incurably blind through support to education and rehabilitation.

14. Danish International Development Agency
Ministry of Foreign Affairs
Amaliegade, 7, DK - 1256
Copenhagen, Denmark

15. Department of Health and Human Services
Office of International Activities
Social and Rehabilitation Services
Washington, D.C. 20201

16. Direct Relief Foundation (DRF)
Post Office Box 1319
Santa Barbara, California 93102
(805) 966-9149

Dennis G. Karzag, Executive Director

During 1979-80 five ophthalmologists volunteered their services through Direct Relief and served in Nepal (2), St. Luca, Guatamala and American Somoa. Their period of eye health care provision averaged seven weeks.

DRF is also involved in indirect support of vision care. The Kiwanis/DRF eyeglass collection program has gathering hundreds of thousands of used eyeglasses to be distributed through programs of Amigos de las Americas in Central and South America and of the Nicaraguan Ministry of Education in their Nicaraguan literacy campaign.

DRF is also involved in a multitude of other direct and indirect health care projects.

17. Eye Care, Inc.
Suite One
523 8th Street S.E.
Washington, D.C. 20003
(202) 789-2612

E. Timothy Carroll, Executive Director

Eye Care, Inc., working in Haiti, has built and equipped an ophthalmic operating suite in Port-au-Prince. They are also committed to building rural eye clinics and the training of allied health personnel on the island of Haiti. Eye Care, Inc., and Eye Care Haiti, are proposing to expand the current range of activities in Haiti to include rehabilitation of the visually impaired.

18. Eyes for the Needy
549 Milburn
Shorthill, New Jersey 07078
(609) 376-4903

This indirect support agency supplies new and used eyeglasses for vision care projects in the Americas.

19. FCCUS
Loyola University Medical Center
Department of Ophthalmology
New Orleans, Louisiana

This group arranges eye health care projects run by ophthalmologists in Haiti, Columbia and Nigeria.

20. French Government - Ministry of Cooperation
20 Rue Mansier
75700 Paris, France

21. Helen Keller International, Inc.
22 West 17th Street
New York, New York 10011
(212) 620-2100

Harold G. Roberts, Executive Director
Susan Eastman Leone, Project Officer

Formerly American Foundation for Overseas Blind, Inc. See text pages 20-21.

22. ICCO
Stadhouderslaan 43
Utrecht, The Netherlands

23. Instituto Internacional Para Ninos
Buschental 3347
Montevideo, Uruguay

Dr. Eloisa de Lorenzo

24. International Agency for the Prevention of Blindness
Commonwealth House
Haywards Heath
Sussex RH 16 3AZ, England

Sir John Wilson, President

25. International Association of Lions Clubs
300 22nd Street
Oakbrook, Illinois 60570
(312) 986-1700

Mrs. Fran Fullerton, Research and Health Activities Manager

Lions Clubs throughout the world are involved in a wide variety of indirect support programs such as fund raising and the collection of used spectacles. Several Lions Club chapters in developing countries also assist with organization and setting up of direct care delivery.

26. International Council for Education of the Visually
Handicapped
Postfach 364 , D-6140
Bensheim 1, West Germany

Mr. Wolfgang A. Stein, International President

27. International Development Research Centre (IDRC)
Box 8500
Ottawa, Canada K16 3H9

Ivan L. Head, President

IDRC is an indirect support agency established and funded by the Canadian Government. As its name implies, its work is

research oriented, either through the funding of other organization's research or its own. IDRC has funded research into blindness prevention, treatment and rehabilitation.

28. International Eye Foundation (IEF)
7801 Norfolk Avenue
Bethesda, Maryland 20014

Dr. Robert Meaders, Medical Director

IEF sends instructors to developing countries to train ophthalmic assistants in basic eye health care, undertakes health education programs relating to eye care and nutrition and initiates blindness prevention projects. They also conduct prevalence surveys of eye disease. Projects are concentrated in Kenya.

29. International Optometric and Optical League
10 Knaresborough Place
London, F W-5 CT6 England

Peter Smith, Executive Secretary

This professional organization holds conventions for the advancement of international optometric and optical knowledge and sets standards for professional care and education.

30. International Organization Against Trachoma
Paris, France

Professor G. Coseas, President

31. International Services for the Blind
(no address or information available)

32. International Vitamin A Consultative Group
IVACG Secretariat
The Nutrition Foundation, Inc.
489 Fifth Avenue
New York, New York 10017

C.C. Chichester, Ph.D.

33. LIGA International
24953 Paseo De Valencia, Suite 6-C
Laguna Hills, California 92653

Dr. William B. Buethe, Co-Director

LIGA teams have been providing general health care to the indigents of North Western Mexico since 1948. Health care teams fly private aircraft monthly to pre-established clinics mostly in the states of Sonora and Sinloa, Mexico. Participants, who

provide their own funding and equipment, are mostly from California. Clinics usually last one to three days. Vision and eye health care are integral parts of the LIGA program.

34. Medical Group Missions of the Christian Medical Society
P C Box 689
Richardson, Texas 75080

This group has two vision and eye health care missions a year to the Dominican Republic or Honduras. They utilize ophthalmologists, optometrists and opticians in large clinics.

35. Middle East Committee for the Welfare of the Blind
P C Box 3465
Riyadh, Saudi Arabia

Mr. Abdullah M. Al-Ghanim, President

36. Netherlands National Association for the Prevention of
Blindness
Cogzickenhuis, Leyweg 295
2545 CJ The Hague, The Netherlands

37. Operation Eyesight Universal
P C Box 123
Calgary, Alberta T2P 2H6
Canada
(403) 283-6323

Harold H. Cowie, Assistant Director

See text pages 18-19.

38. Organizacion Nacional de Ciegos
Jefatura
Jose Ortega Y Gasset 18
Madrid 6, Spain

Mr. Pedro Zurita

39. Partners of the Americas
2001 S Street, N.W.
Washington, D.C. 20009
(202) 332-7332 Telex 64261

Gregory L. Dixon, Director

Partners of the Americas are involved in the education and rehabilitation of the blind in parts of Latin America and the Caribbean.

40. Royal Commonwealth Society for the Blind
Commonwealth House
Haywards Heath
Sussex, RH 16 3AZ, England

Sir John F. Wilson, C.B.F. Director

The Society has programs in 49 countries located mainly in Asia, Africa and the Middle East. With the use of eye camps and mobile units these programs provide general ophthalmic care as well as cataract surgery. The society also supports programs for the education and rehabilitation of the blind.

41. SEVA Foundation
108 Spring Lake Drive
Chelsea, Michigan 48118
(313) 475-9373

Lawrence B. Brilliant, Executive Director

SEVA is an acronym for the Society for Epidemiology and Voluntary Assistance. This organization has been working since 1979 in conjunction with the Ministry of Health of the Government of Nepal and WHO in blindness prevention, treatment and surgical rehabilitation in Nepal, as well as in a project to train indigenous professional and auxiliary eye health care personnel for this mountainous country.

42. Student Optometric Association (SCA) Amigos Committee
Pacific University College of Optometry
Forest Grove, Oregon 97116
(503) 648-5630 ext. 276

Dr. Larry Clauson, Faculty Advisor
Melissa Cole and Eugene De Mayo, Co-chairpersons

The SCA Amigos Committee is involved in the collection and verification of used spectacles. The Committee then sends students and spectacles to Central America to assist Amigos de las Americas with their vision screening and spectacle distribution projects. The students perform vision screenings, distribute spectacles to those in need of refractive correction and detect and refer pathologies that could lead to visual impairment.

43. Student Optometric Service to Haiti (SCSH)
Pennsylvania College of Optometry
1201 W. Spencer Street
Philadelphia, Pa. 19141
(215) 276-6000

Working in Haiti SCSH students provide complete vision examinations, dispense new and used eyeglasses to those who

require corrective lenses, and refer all pathologies requiring treatment or surgical intervention. From 1969 through 1977 SOSH has seen about 30,000 patients, dispensed 15,000 eyeglasses and treated over 1,000 potentially sight threatening pathologies.

44. Student Volunteer Optometric Services to Humanity (SVOSH)
419 South Sixth Avenue
Lewisburg, Tennessee 37091

Dr. Donald I. Holbrook, VOSH-SOSH/SVOSH Liaison

SVOSH groups work out of many of the colleges of optometry in the U.S.. All of them keep in coordination with the parent organization, VOSH. SVOSH projects are either included in VOSH projects or, if independent, utilize the same organizational and care delivery procedures as VOSH. Projects have been located in Central America and the Caribbean.

45. Surgical Eye Expeditions (SEE) International, Inc.
Santa Barbara, California 93102
(805) 962-3035

Richard H. Davis, Executive Director

This eleven chapter agency organizes weekend eye health care excursions in Mexico for ophthalmologists.

46. University of Waterloo
School of Optometry
Waterloo, Ontario, Canada N2L 3G1
(519) 885-1211

Dr. E.J. Fisher

Since 1971 the University of Waterloo School of Optometry has been delivering vision care to the West Indies chain of islands in the Caribbean. An analysis of this project showed that during six years over 100,000 patients underwent a vision screening or examination and more than 6,000 pairs of eyeglasses were supplied for an average cost of \$3.58 per patient.

47. Voluntary Health Association of India
C - 14, Community Centre
Safdarjung Development Area
New Delhi - 110016 India
652007

Mrs. Chandra Kannapiran, Information Services in charge

This government sponsored agency is involved in all aspects of vision and eye health care delivery and training and education and rehabilitation of the blind in India.

48. Volunteer Optometric Service to Humanity (VOSH) International
Box 3387
Mankato, Mn. 56001
(507) 387-4191

Dr. Russ Dorland, President

See text pages 12-15

49. Volunteers for Vision, Inc.
14600 Agarita Road
Austin, Texas 78734
(512) 451-3001

Mrs. J. Riley, Recording Secretary

50. World Council for the Welfare of the Blind
S - 122 88 Enskede
Sweden

Mr. Anders Arnor, Honorary Secretary General

51. World Health Organization (WHO) Headquarters
1211 Geneva 27
Switzerland

Dr. M.L.Tarizzo, Programme Manager
Programme for the Prevention of Blindness
Dr. E.M.De Maeyer, Medical Officer
Nutrition Unit
Dr. P.Rosenfeld, Special Programme for Research and
Training in Tropical Diseases

WHO is involved in research and many world wide direct and indirect care programs dealing with visual impairment and blindness prevention and treatment and education and rehabilitation of the blind. Information concerning specific projects or geographical areas can be requested from the above and following addresses.

- a) WHO Regional Office for Africa
P.O. Box 6
Brazzaville, Congo
- b) WHO Regional Office for the Eastern Mediterranean
P.O. Box 1517
Alexandria, Egypt
- c) WHO Regional Office for South-East Asia
World Health House
Indraprastha Estate, Ring Road
New Delhi - 110001, India
- d) WHO Regional Office for the Western Pacific
P.O.Box 2932
12115 Manila, Philippines

- e) Pan American Health Organization
Pan American Sanitary Bureau
Regional Office of the World Health Organization
525 Twenty-third Street N.W.
Washington, D.C. 20037
- f) WHO Regional Office for Europe
8 Scherfigsvej
2100 Copenhagen O, Denmark

The following programs receive WHO funding through the WHO Programme for the Prevention of Blindness:

- g) Onchocerciasis Control Programme
B. P. 549
Cuagadougou, Upper Volta

Dr. B. I. Thylefors
- h) The Eye and Ear Hospital "Dr. Rodolfo Robles V."
Comite Nacional Pro-Ciegos
2a. Calle A 35-34, Zona 11
Guatamala, Guatamala

Dr. Luis N. Figuero, Medical Director
- i) The International Center for Epidemiologic and Preventive Ophthalmology
The Wilmer Institute
The John Hopkins Hospital
Baltimore, Maryland

Dr. Hugh Taylor, Co-Director
- j) National Eye Institute
National Institutes of Health
Bethesda, Maryland 20014

Dr. Carl Kupfer, Director
- k) WHO Collaborating Center for Prevention of Blindness and Trachoma
Francis I. Proctor Foundation for Research in Ophthalmology
University of California
San Francisco, California 94143

Dr. Chandler R. Dawson, Director
- l) WHO Collaborating Centre for Trachoma and Other Chlamydial Infections
Institute of Ophthalmology
University of London
London, England

Professor B. R. Jones, Director

52. World Medical Relief, Inc.
11745 12th Street
Detroit, Michigan 48206
(313) 866-5333

Mrs. L. G. Auberlin, President

This indirect support agency provides eyeglasses, medical supplies and/or equipment for vision and eye health care projects.

53. World Vision
(address not available)

Don Weisbroad, Director

This organization supports programs directed toward the welfare of children. They were involved in the California Mobile Optometric Clinic's vision care program in Guatamala during the summer of 1980.

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