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THE PAN AMERICAN HEALTH ORGANIZATION

**EMERGENCY PREPAREDNESS & DISASTER RELIEF
COORDINATION PROGRAM:**

AN EVALUATION

*Decentralized Management
Regional Cooperation
National Preparedness Policy
Inter-Agency Collaboration
Health Preparedness Training
Disaster Information Management*

Office Of Foreign Disaster Assistance

Evaluation Of

The Pan American Health Organization

Emergency Preparedness and Disaster Relief

Coordination Program

Costa Rica, Honduras, El Salvador, and Ecuador

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BY

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ABBREVIATIONS USED IN EVALUATION REPORT

AMRO	Americas Regional Office (WHO)
BHM	Basic Health Management
CATSS	Technical Advisory Committee for the Health Sector
CDD	Centro de Datos y Documentación (Data and Documentation Center)
CEPREDENAC	Coordinating Center for the Prevention of Natural Disasters in Central America
CIDA	Canadian International Development Agency
COPECO	Commission for Disaster Prevention Activities
COTIDE	Technical Advisory Committee for Disasters and Emergencies
DHA	Department of Humanitarian Affairs
DMTP	Disaster Management Training Program
EMS	Emergency Medical Service
EMT	Emergency Medical Technician
IDNDR	International Decade for Natural Disaster Reduction
LAC	Latin America and Caribbean
MFA	Ministry of Foreign Affairs
MOE	Ministry of Education
MOH	Ministry of Health
MOI	Ministry of Interior
MSF	Médecins Sans Frontières (Doctors Without Borders)
NGO	Non-Governmental Organization
OAS	Organization for American States
OFDA	Office of Foreign Disaster Assistance
PAHO	Pan American Health Association
EPD	Emergency Preparedness and Disaster Relief Coordination Program; Spanish: Programa de Emergencias y Desastres
PMP	Preparedness, Mitigation and Prevention
SIDA	Swedish International Development Agency
SOW	Statement of Work
SS	Social Security
SUMA	Sistema de Manejo de Suministros Después de Desastres (Supply Management System for Post Disaster Relief)
TA	Technical Assistance
UN	United Nations
UNDP	United Nations Development Program
UNICEF	United Nations Children's Fund
USAID	United States Agency for International Development
WHO	World Health Organization

EXECUTIVE SUMMARY

A. Introduction

This report is an interim evaluation of a United States Agency for International Development (USAID)/Office of Foreign Disaster Assistance (OFDA) grant to support the Pan American Health Organization's (PAHO) Emergency Preparedness and Disaster Relief Coordination Program (EPD). USAID has provided support to PAHO for disaster mitigation and preparedness in the health sector of Latin America and the Caribbean (LAC) since 1981. USAID's share of EPD funding, over \$3 million, represents about 20% of total funding, while CIDA has provided the largest portion of donor assistance.

The purpose of the PAHO/EPD is to help health and related sectors in LAC countries prepare for and manage disasters. The major constraint addressed by the Program is a weakness in host country health sector capability to respond to disasters. Expected results of the assistance include an improved capability of health institutions to manage disasters. A longer-term intended Program impact is reduction in morbidity and mortality resulting from natural and man-made disasters. Specific program areas of disaster health preparedness supported by OFDA's grant to PAHO are the following:

- management of national health preparedness and response
- education and training in key preparedness functions
- regional capacity of health sector in emergency preparedness and response
- mass casualty management by hospitals and other health care facilities
- communication of health-needs information in emergency decision-making
- inter-regional cooperation among national health disaster preparedness programs

This evaluation is focused on the above areas.

The evaluation was made during a five week period from July 7 to August 17, 1993. It was restricted to four LAC countries, Costa Rica, Honduras, El Salvador and Ecuador. Costa Rica and Ecuador were chosen specifically because of the location of PAHO sub-regional offices, respectively, for Central and South America. Central American countries are over-represented because of difficulties in getting USAID Mission clearance to travel to certain South American countries due to prevailing political conditions. The evaluation team included a physician-epidemiologist and disaster management specialist.

B. Findings

The evaluators found that the positive reputation of PAHO in general and EPD in particular, including an especially positive perception of the sub-regional office staffs, is an important stimulus to program development. Technical assistance, training courses, emergency supply management, and hospital mitigation program components were found to make critical and high quality inputs to individual country and sub-regional preparedness and response

programs. PAHO/EPD sub-regional offices have been successful in promoting inter-country disaster management activities, evidenced by agreements among Chile and Peru and Ecuador and Colombia in cross-border disaster health management.

The Program is recognized as a leader in the development and dissemination of disaster preparedness educational materials. Furthermore, its training courses in general health and hospital preparedness were found to respond effectively to demand by national and local disaster authorities, at a low per capita cost. As a result, disaster officials in the four countries visited indicated that they now count on trained national staff to teach health preparedness courses.

PAHO/EPD support for rapid epidemiological assessments to identify basic post-disaster health, water, sanitation and housing needs has been successful.

In the area of mass casualty management, the evaluators found that one constraint to standardizing norms for preparedness assistance is that in none of the four countries is the Ministry of Health the most influential agency in providing health preparedness and relief. Related are the findings that hospital emergency preparedness plans were in various states of preparation in the four countries and there was a lack of adequate human resources and equipment for on-site treatment of severe injuries. These weaknesses cannot be attributed to PAHO/EPD, nor can they be overcome through the Program alone, but are instead due to other causes. Such causes are the low commitment of some of the participating countries to support disaster health preparedness and the non-existence of an emergency medical system, including trained paramedics.

Recommendations

The following is a summarized, prioritized list of recommendations:

- 1) Since health sector preparedness is conditioned by so many non-health-related agencies and organizations, it is very important that support be given to a formal approach to interagency planning in which policies, guidelines and standards are formalized; PAHO/EPD should actively promote this approach, which will then allow it to play a greater role in institutionalizing preparedness more broadly across the region.
- 2) Because some national disaster authorities were found to have only a short-term planning capability and, in addition, little or no monitoring and evaluation capacity, it would be appropriate for PAHO/EPD to take an approach designed to account for different levels of country need, including the degree of preparedness promotion; such an approach would blend well with the Program's already effective use of the decentralization model.

- 3) Since the four countries visited, with the exception of Costa Rica, do not routinely monitor and evaluate their preparedness programs, often resulting in their not knowing where or whether to give political or financial priority to preparedness -- attention needs to be given to promoting activities that increase the planning, coordination, and monitoring and evaluation capacity of disaster assistance agencies; PAHO/EPD needs to invoke the interest of donor agencies in supporting the development of this capacity.
- 4) In light of presumed increasing levels of national self-sufficiency in preparedness, PAHO/EPD should devote even greater attention than it already does to promotion of trans-national collaboration, including: border region or other bi-national disaster management cooperation; sub-regional disaster health management programs; and sub-regional "postmortem" evaluation exchanges.
- 5) Given the limits on PAHO/EPD's resources in raising the level of consciousness and technical ability of health disaster management personnel across the LAC Region, PAHO/EPD should prioritize the distribution of promotional materials and decentralize the information resource function to individual member countries.
- 6) A critical constraint to standardizing norms for preparedness assistance is that in none of the four countries visited is the Ministry of Health (MOH), although nominally the leader of the sector, the main provider of health disaster preparedness and relief. Once PAHO/EPD has assessed the level of a member country government's commitment to emergency health preparedness, the Program should focus on reinforcing MOHs where there is a high degree of shared commitment; one obvious sign of such a commitment is governments' provision of resources for health preparedness activities, including appropriate health personnel with whom PAHO can work.
- 7) Officials highlighted triage and mass casualty management training of emergency management personnel as a high priority need; their concern points to the need for participating country health authorities to review their concept and planning of pre-hospital preparedness generally; PAHO/EPD, perhaps in concert with interested donors, should therefore support an evaluative review of disaster pre-hospital attention capabilities.
- 8) Although the need for rapid epidemiological assessment has already been addressed by PAHO/EPD in a variety of ways, in none of the four countries are there guidelines for rapid post-disaster assessment of health and sanitation needs; therefore, a future focus of the program should include development of rapid epidemiological assessment guidelines -- including cluster sampling methodology -- for use in training disaster health personnel.

Conclusions

Overall, this evaluation indicates that PAHO/EPD has achieved positive results in the health emergency preparedness arena. In certain key areas, such as education and training, results are quite successful. In others, especially mass casualty management, progress is slower and in need of a boost. Whether the program is more or less successful, however, depends in part on its being tailored to a country's specific emergency preparedness needs. The extent to which these needs are developed, in turn, depends on the degree of political priority (i.e., resources) governments give to preparedness.

In general, the evaluation has found that the PAHO emergency health preparedness program could benefit from even greater decentralization and tailoring of its program to countries with high vulnerability and high priority in preparedness. Part of the tailoring function requires, first, however, that LAC countries receive support from the Program in institutionalizing policy planning, design and administration of emergency preparedness practices. Simultaneously, PAHO/EPD might then be able to phase out direct support of successful country programs. A consequence would be that successful country preparedness programs could, through PAHO/EPD, lend their technical support to the others.

I. BACKGROUND

The Pan American Health Organization (PAHO) has been involved in the development of country, sub-regional and regional-level programs in disaster preparedness, mitigation and prevention (PMP) since the late 1970s. Since the development of an Emergency and Preparedness and Disaster Relief Coordination Program (EPD) at the PAHO headquarters in Washington, DC, activities have concentrated on support for development of member country programs. These have focused on fostering awareness at the highest government levels of the vulnerability of the countries and their populations to natural, man-made and environmental disasters.

Prior to the development of PAHO/EPD activities, most activities in the field of natural and man-made disasters were oriented towards disaster relief. Since the development of the Program, the activities have expanded to emphasize the preparedness of countries and the many different sectors to respond appropriately when a disaster occurs. These activities are also directed towards reducing morbidity and mortality as a result of natural and man-made disasters. This has been accomplished through the development of norms and guidelines and through educational and training activities. More recently is the addition of mitigation activities, including promotion of vulnerability studies of key physical facilities.

Prior to the inauguration of the International Decade for Natural Disaster Reduction (IDNDR) (1990s), PAHO was the primary multilateral implementing agency for prevention, mitigation and preparedness activities in the Americas Region. PAHO/EPD has received support from the Canadian International Development Agency (CIDA) and the United States Agency for International Development Office of U.S. Foreign Disaster Assistance (USAID/OFDA) as well as from the Dutch Government and other bilateral assistance agencies. OFDA's portion is about 20%, CIDA's 75%, and 5% divided among the rest.

In 1990 CIDA conducted a general evaluation of the PAHO/EPD activities. In 1993, AID/OFDA called for an evaluation of its grant covering the preceding five years of Program activities.

II. PAHO PROGRAM OBJECTIVES

The purpose of the Emergency Preparedness and Disaster Relief Coordination Program, implemented by PAHO, as specified in the program document, is to provide technical support for the following :

- management of national health preparedness and response
- education and training in key preparedness functions
- regional capacity of health sector in emergency preparedness and response
- mass casualty management by hospitals and other health care facilities
- communication of health-needs information in emergency decision-making
- inter-regional cooperation among national health disaster preparedness programs

Components of the Program are: (1) Overall Project Management and Evaluation; (2) Educational/Training Materials; (3) Support to National Programs; (4) Hospital Preparedness; (5) Training of Environmental Health Professionals; (6) Field Assessment of Health Needs; (7) Technological Disasters; and (8) Cooperation with Other World Health Organization (WHO) regions. OFDA's support is mainly directed towards numbers 1-4 and 6, while numbers 5 and 7 are not of direct interest.

Expected outcomes of the program are, among others:

- acceptance by participating countries of the need for a national health preparedness program
- use of materials published through the program, including incorporation in curricula of training institutions and universities
- improved techniques, staff training, and hospital preparedness in responding to major accidents
- specialists trained in disaster management environmental health, and
- improved capability of health institutions to manage disasters

A longer-term intended Program impact is reduction in morbidity and mortality resulting from natural and man-made disasters. While this result is not in the "manageable interest" of the Program per se, it is nevertheless the goal towards which program components should add up to. The horizon for achieving this goal -- which is in the hands not of PAHO/EPD, but rather of the host country -- is, on average, in the eight to ten year range.

III. EVALUATION METHODOLOGY

A. Methodology Employed

The evaluation was undertaken in four of the LAC region countries -- Costa Rica, El Salvador, Honduras and Ecuador. The first three of these comprise members of the Central American sub-region, with the PAHO/EPD sub-regional office located in San Jose, Costa Rica. Ecuador forms part of the South American sub-region and is the EPD sub-regional office. Prior to 1993 this latter office was located in Lima, Peru.

The countries included in the evaluation are not necessarily 'representative' of the sub-regions in which they are located or of the Americas region as a whole. Consequently, the results, while specifically relevant to the individual countries, should be interpreted carefully on a comparative basis. Furthermore, the fact that two of the countries studied comprise the sub-regional centers of the PAHO/EPD, suggests that those countries might have benefitted more so than the others from the intervention or, perhaps, that they were better off in the first place; on the other hand, these two countries serve in a sense as models for the rest of Latin America.

The methodology employed to conduct the evaluation consisted of reviews of relevant documentation and interviews with personnel in the numerous governmental, non-governmental and international organizations involved in disaster preparedness, prevention and mitigation. While selected health facility sites were visited, the evaluators did not have time to visit disaster health management facilities in areas of recent disaster. A list of persons met with during the course of the evaluation is included in Annex C.

Documentation reviewed included the following: PAHO/EPD program statements and periodic evaluations or activity reports; existing disaster preparedness manuals and plans; situation reports and descriptions of recent disaster events; training manuals; and materials and course content documents.

Interviews, on an individual and group basis, (in general, with members of disaster management or health preparedness committees) were conducted with representatives of the health sector per se, as well as from other sectors directly related to disaster management. Thus, interviews were conducted with persons from: the public health sector¹, the private

¹ Ministry of Health (MOH) and Social Security (SS)

health sector², the voluntary sector³, the academic sector⁴, Ministries of Foreign Affairs (MFA), Civil Defense (CD), the Armed Forces, and international organizations⁵.

Interviews were conducted with over 60 persons during a total study period of nearly four weeks. Two days of preparatory meetings were held with Basic Health Management (BHM), PAHO/PED, and OFDA staff in Washington, D.C. and, subsequently, four and a half study days were spent in Costa Rica; five each in El Salvador and Honduras; and six in Ecuador.

B. Limitations and Constraints

The complexity and highly differentiated nature of PAHO/EPD program activities, the range of countries involved, and the demands of the Statement of Work (see Annex B) place inevitable limitations on the present study. The time available for the study was, in short, limited-- given the above conditions and the logistics of getting easily from one country to the next.

² Private hospitals and clinics

³ Red Cross, Non-governmental Organizations (NGOs) e.g., Partners of the Americas

⁴ Ministry of Education (MOE), Faculties of Medicine, Faculties of Public Health, Faculties of Civil Engineering, and Faculties of Geology

⁵ PAHO, United Nations Development Program (UNDP), USAID/OFDA, the Italian Cooperation

IV. EVALUATION FINDINGS

At the outset of presenting the evaluation findings, it should be stated that the extensive efforts and inputs of PAHO/EPD are showing positive results. Prior to the Program intervention, activities were almost exclusively directed to provision of relief supplies and personnel. In the early stages of the PAHO/EPD Program, activities in the field of disaster preparedness began to shift to relief effort preparedness. As the assistance provided by the Program began to take hold, a notable and observable outcome has been a re-orientation of activities of many of the participating agencies and organizations to include prevention as an important component of preparedness.

A. Program Administration, Planning and Monitoring

1. Inter-agency Planning and Collaboration

Description and Accomplishments

The problem of planning, implementing, and coordinating project activities among countries finds a corollary in the promotion of joint inter-agency projects or programs in the disaster preparedness and response area. Up to 1990 it was difficult just to affirm that PAHO/EPD was the major (if not only) multilateral regional program in preparedness. After 1990, given the range of demands on the Program and the fact that health sector preparedness is conditioned by so many non-health related factors (e.g., housing quality, land use controls, logistics and transport resources), there is a need for a formal approach to interagency planning in which policies, guidelines and standards are formalized.

A challenge for the mid-1990s will be to plan and implement joint multi-sectorial/multi-agency schemes at a time when other U.N. and bi- or multilateral agencies are showing an increasing interest in the disaster problem. The efficient use of scarce resources demands a multi-agency planning process, inevitably requiring the participation of PAHO/EPD with other agencies or organizations. The hospital mitigation project is an example of where collaboration, in this case, between PAHO, United Nations Development Program (UNDP), the Organization of American States (OAS) and the international development banks, could be highly beneficial.

Issues and Recommendations

Participating countries need to continue giving attention to general administration and planning, though with a particular focus on the institutionalization of interagency planning of disaster health preparedness activities. With the institutionalization of such planning policies, guidelines, and standards there is a greater chance of acceptance by a broader group of countries. PAHO/EPD sub-regional and national offices would then be able to tailor the planning approach to each country's specific needs according to an agreed-upon, region-wide set of health preparedness planning criteria.

2. Decentralized Program Design and Administration

Description and Accomplishments

The PAHO/EPD program is promoted and administered on a decentralized basis in Latin America, through sub-regional offices located in San Jose, Costa Rica (for Central America) and Quito, Ecuador (for South America). The sub-regional representatives work in close liaison with assigned EPD counterparts at PAHO headquarters and with local and national program coordinators designated by the Ministries of Health in each country.

Decentralization is an effective approach on the part of PAHO/EPD to management and control of activities and the needed flexibility in program formulation, budgetary design and financial outlays. An intimate knowledge of the different countries within the sub-region and close links between PAHO/EPD sub-regional representatives and their local counterparts effectively facilitates the identification and implementation of program activities.

the sub-regional offices have only one permanent scientific/technical appointee (the representative) who is complemented by project-designated (SUMA and Hospital Mitigation) or general support professionals, financed through bilateral agreements with countries (e.g., Dutch, Italian, Belgian) on a short to medium term basis (2-4 years).

The permanent sub-regional representative acts as a liaison with the central PAHO/EPD office in Washington D.C., as general coordinator of EPD projects and activities implemented from or related to the sub-regional office, and liaison with the national counterparts in the member sub-regional countries.

Country-based activities (and budgetary allocations) are 'negotiated' on an annual basis by the sub-regional representative and national coordinators. The principal requests for technical assistance and training courses now originate from the national level. Once national budgetary allocations are decided, finances are transferred to and executed by the local PAHO representative.

Issues and Recommendations

The number of countries covered by the sub-regional offices and the increasing range of activities promoted places considerable strain on the limited human resources available at the sub-regional office level. This is particularly the case for South America, where the number of countries covered is complicated by distances and the geographical size of many of these countries. In accord with the CIDA evaluation recommendation, the opening of a sub-regional office for the Southern Cone countries should be carefully considered, though the source of funding at this time is not clear.

Coordination and promotion activities among sub-regional offices are highly dependent for their continuity on the present sub-regional representatives. Changes by or absence of these

professionals can have significant repercussions on program development, given the lack of additional medium-to-long-term appointments. The efficient promotion and implementation of activities requires an intimate knowledge of the countries covered by the sub-regional offices and close personal and professional relationships between sub-regional and national coordinators. Therefore, reliance on one or two professionals is a potential problem.

The increased range of activities and the need for increased levels of coordination on a global project and inter-project level may require a permanent assistant representative at the sub-regional office level. This position could be designed so as to be responsive to the need for increased evaluation and monitoring activities proposed later in the report.

The location of the sub-regional offices in only a few, selected countries clearly has an important impact in terms of PAHO/EPD program development. The positive reputation of PAHO, in general, and EPD, in particular, as well as the more permanent presence of staff in these sub-regional offices is an important stimulus to activity development. Countries where national authorities give a low priority to disaster preparedness in fact need more permanent technical and organizational support than is presently possible for the sub-regional coordinators to provide.

One constraint of emphasizing low priority countries, though, is the very limited number of professional counterparts to work with PAHO staff and consultants.

Options for resolving the above type of problem are clearly related to financial resources and logistics. One option is the appointment of short or medium-term appointment of PAHO/EPD staff in countries where there is a coincidence between a low commitment to health disaster preparedness and high disaster vulnerability.

Questions of supply and demand, however, must be separated for our purposes. The development of PAHO/EPD-promoted activities is partly dependent on technical support requests from national coordinators and authorities. It is they who plan disaster preparedness organization and activity. Complicating the issue of local demand is the fact that in some countries the annual programming and budgeting procedures are not designed from a medium or long-term planning perspective. Therefore, there is little likelihood that a strategy or program will be established over, for instance, a 3-5 year period with activities in subsequent years building on present or previous year activities.

Besides the absence of a mid- to long-term planning capability from the administrative side, some of the countries lack an institutional capacity to evaluate and monitor progress or problems in their emergency preparedness programs. Because it is difficult to deal with dozens of country programs all of which have different standards and sophistication, PAHO/EPD -- given its limited financial and personnel resources -- has taken the approach of standardizing its assistance.

In light of the above situation, consideration could be given to promoting increased diagnostic, evaluation and monitoring capabilities and to strategic planning at the national level. Such an approach would address all health preparedness activities (whether PAHO/EPD-promoted or not). Despite obvious difficulties related to guaranteed financial availability and other difficulties, the preparation of formal 3-5 year strategic plans should be encouraged at the national level, which parallel the 3-5 year cycles of PAHO/EPD financing.

3. Sub-regional versus National-Level Activities

Description and Accomplishments

An important observation concerns the distinction of managing and coordinating national preparedness activities and PAHO-supported sub-regional activities. PAHO/EPD sub-regional offices have their own concept, logic, rationale and functions. These offices provide more than the simple coverage of the sum of countries included within their scope. They must also develop opportunities to promote bilateral or multi-lateral activities. Excellent examples of this type of activity, for which PAHO/EPD is particularly well-placed to promote, are the agreements established and/or signed between Chile and Peru and Ecuador and Colombia in cross-border disaster health management.

Issues and Recommendations

The dominant focus of PAHO/EPD activities is still understandably directed at the national level. During the 1990s, with presumed increasing levels of national self sufficiency in the promotion and implementation of health preparedness and mitigation schemes, opportunities for bi- and multi-national or sub-regional and regional activities will probably increase.

Consideration should be given to the increased promotion of trans-national collaboration schemes, including:

- Border region, bi-national disaster management programs.
- Sub-regional disaster health management programs (e.g., for the Central American or Andean Countries).
- Sub-regional 'postmortem' meetings to discuss and evaluate responses to disasters that occur in the respective countries, based on disaster response assessments.

B. Education and Training

1. Materials and Resources

Description and Accomplishments

Many manuals and informational materials (video cassettes, bulletins, news letters, etc.) are produced by the Program. Much of this is done through coordination with other external agencies, including Italian Cooperation, national affiliates of the Red Cross Society and universities within the region.

In the field of disaster preparedness in Latin America, PAHO/EPD is recognized as a leader in development of educational materials. Interviews with personnel in all sectors revealed a high level of appreciation for PAHO/EPD material and the value of it as a training tool. In addition to the audiovisual training materials, which cover all of the sub-components of disaster prevention, mitigation and preparedness activities, as well as recent disasters, the Program has developed a full set of teaching slides and manuals covering the project sub-components. They are available on request from the country program personnel.

The PAHO/EPD Documentation Center, begun in 1990, and located in San Jose, Costa Rica, provides an excellent and unique service to Latin American users. An increasingly comprehensive and wide-ranging collection of educational materials has been stored and classified. It is available to interested professionals on request, using free photocopying and distribution facilities. Classified indices of publications are prepared and distributed regularly. The majority of the publications stored are donations from institutions and individuals, covering both health and non-health disaster topics.

Issues and Recommendations

The majority of the health preparedness educational manuals was originally prepared in the early 1980s and has been reprinted since. These should be revised and updated, where appropriate.

The Documentation Center, normally taxed beyond its operating capacity (due to limited resources), is nevertheless presently under-utilized. At the same time, there is increased external demand for photocopied materials and other services. Photocopies are provided free of charge to all persons or institutions that solicit them. However, no system presently exists for controlling or prioritizing such requests and, given the demand levels, inevitable delays are experienced in responding to requests.

Given the excellent services offered by the Center, offering a unique and indispensable resource for the preparedness community of the LAC region, the following recommendations are made:

- Increased resources should be allocated for the Center, on a multi-agency basis.
- Short-term prioritization of the distribution of materials should be considered; here, health and disaster preparedness institutions in general (as opposed to individuals) should be given priority for free distribution, and for individuals, some sort of nominal cost should be charged to cover reproduction costs.
- Consideration might be given to the establishment of an official reference documentation service in each country, which would receive copies of the most frequently requested or important documents, in order to avoid multiple transmission of the same documents to any one country.
- Copies of important documents should be sent automatically to key health preparedness personnel throughout the region.

2. Training Courses

Description and Achievements

The PAHO/EPD Program continues to support a large number of educational and training activities in disaster preparedness and relief management. These activities are predominantly the result of demands generated at a national level, by local authorities. They are developed at a low per capita cost to the program and are concentrated mainly in the areas of general health and hospital preparedness (including mass casualty management).

An unequal distribution of educational activities occurs across the region, particularly in South America. This situation reflects different levels of the following: consciousness and motivation of national authorities; institutional consolidation in the health preparedness area; and direct communication with sub-regional office staff.

The Program has amply supported national demands for training support in "traditional" areas and stimulated innovative approaches in others. The disaster management courses conducted for personnel of the Ministries of Foreign Affairs are a good example of the latter, having contributed to the production of manuals detailing procedures for Embassy and other Ministry of Foreign Affairs staff in the case of national emergencies.

Interviews of disaster officials in the four countries suggest that the countries now count on trained national staff to teach health preparedness courses. PAHO/EPD support is still required for material and financial support, reflecting both the limited budgetary resources available to many countries and the priority given to these by the health sector.

Increasing attention has been given to incorporating disaster preparedness in permanent educational modules in university curricula in LAC countries. Presently, plans developed by the Central University in Ecuador to include curricula development are probably the most advanced and comprehensive in coverage (including a degree in emergency management).

Some medical schools have a community medicine/social medicine track as part of the basic curriculum. The experience of the University of Costa Rica is instructive. There, students undertake their community work in disaster-prone communities. At the University of El Salvador, a community-based approach to disaster preparedness has been part of the Medical Faculty curriculum for several years. These are both good candidates for replication in other parts of the region.

From an overall perspective, there is no doubt about the impact of the program in heightening the level of consciousness and technical ability of disaster management health personnel.

A review of available documents and discussions with professional personnel revealed a high level of knowledge by health officials of disaster health preparedness and relief management. Internationally accepted technical norms were found to be well understood by the field personnel in the countries visited.

The contribution health professionals can make to an efficient and effective disaster management capability is subject to several intervening variables. Some of these include real levels of institutionalization and the priority and commitment given to disaster management by national authorities. These conditions vary country by country and period by period, dictated by changing economic and political conditions over which PAHO/EPD has no control.

Issues and Recommendations

The following areas of education and training should be subjected to continuous evaluation and monitoring; there should be follow-up on these areas on an annual or short-term planning basis:

- appropriateness of the type and distribution of courses i.e., concentration in some areas and few courses in others. (Only in the case of Costa Rica did some health authorities suggest a need for increasingly more specialized, higher level training, given the level of basic training now achieved.);
- impact of the educational and training activities on real response to disaster events;
- impact of activities on the development of health preparedness instruments (e.g. plans, programs) and their actual implementation;
- coverage offered by the courses to personnel at a local, regional or national level or, according to type or hierarchy of health installation.
- follow-up given to training courses in terms of refresher courses, updating of informational materials, etc.

Evaluation results should offer important inputs to the planning process and course design procedures. Although the scientific and technical base in preparedness in the different countries could be seen as generally adequate, potential problems relate to the logistics of coordination and implementation of activities. Most noted were the perceived deficiencies in preparedness due to limited resources.

3. Public Awareness and Community Participation Programs

Description and Achievements

In the Central American sub-region, most of the countries began training in the schools and in the development of community awareness programs. Through Italian Cooperation assistance in El Salvador, a manual on community preparation for disasters (including the community identification of high risk zones and mitigation and prevention activities) was prepared and distributed to all country program coordinators. This project has been successful in several communities in El Salvador, having originally been developed in the Philippines.

In the countries visited, posters identifying disaster risks and outlining what to do in the event of earthquakes or volcanic eruptions were seen in public places. In all countries there were billboards around the cities with cholera prevention messages. PAHO/EPD began work with the Ministries of Education in developing school disaster preparedness. The focus is on what to do in school if a disaster occurs, and the more general topic of what to do anywhere if a disaster occurs, with the idea that children are excellent diffusers of information to the larger population through their families.

Issues and Recommendations

Community-level approaches to disaster preparedness and mitigation, including health related aspects, are of critical importance. This is possibly the least developed and most difficult area of work in which to have impact. Given the level of the Program's financial and personnel resources, it is difficult to recommend increased attention to community-based approaches in the future. This will require inter-institutional collaboration schemes using such intermediaries as non-governmental organizations, universities and community development associations.

C. National and Regional Programs

1. National Priority of Health Preparedness

Description and Accomplishments

The level of priority assigned to health preparedness activities at a national level can only be directly ascertained or indirectly inferred using such indicators as the level of institutionalization achieved, human and budgetary resources allocated, and organizational and logistical structures established.

In general, the impetus and resources assigned to health preparedness can not be divorced from a consideration of the priority assigned to disaster preparedness and mitigation in general in the countries visited. In this sense, it is difficult to contemplate a well-developed health sector program in a context where the government assigns a low overall priority to the

disaster problem as a whole, and vice versa. A high level of personal and professional motivation and commitment to health preparedness on the part of the specialized health personnel dedicated to such tasks (as is the case in the countries visited), is not in itself sufficient to overcome a low level of commitment to disaster preparedness by high government authorities, where this is the case.

The countries included in this evaluation exhibit different levels of institutionalization of disaster preparedness in general and health preparedness in particular, as described briefly in the following country descriptions.

a) Costa Rica

Costa Rica exhibits the highest level of institutionalization and budgetary allocations for disaster preparedness. A permanent, inter-agency health technical advisory committee exists at the level of the established National Emergency Commission. This Committee meets on a regular weekly basis and is comprised of representatives of all health agencies or organizations involved in disaster management. Furthermore, the Social Security hospital and clinic system has a well established Emergency Committee.

Another useful indicator is the PAHO/EPD's location in offices provided, at no-cost, by the Social Security and the Documentation Center location in no-cost facilities at the National Emergency Commission. All overhead costs (e.g., water, electricity, maintenance) are covered in both cases.

b) El Salvador and Honduras

El Salvador and Honduras have created specialized disaster units in the Ministries of Health (MOH), but with very limited budgetary resources. In Honduras the MOH allocated only \$4,000 to the disaster preparedness unit for 1993. In El Salvador there is no designated full-time program director of the unit. The program director works on a voluntary basis, having a full time position as the Director of the Planning and Normative Division of the MOH. No health sector inter-agency committee for disasters exists in either country, although some of the functions are undertaken by a voluntary based inter-agency technical committee for disasters in El Salvador, and in Honduras an inter-agency committee.

c) Ecuador

In Ecuador, neither a specialized MOH disaster unit, nor inter-agency health committee exists in any meaningful sense.

Issues and Recommendations

The priority assigned to disaster health preparedness at a national level is clearly a function of such intervening variables as the country's vulnerability to disasters, experience with recent

disasters, particularly where the health sector was involved, and the existence of other, more permanent or urgent health priorities. In those countries where high levels of vulnerability are accompanied by relatively low levels of prioritization, as is the case in El Salvador, Honduras and Ecuador, more emphasis must be given to raising awareness levels among high level authorities. This objective can be accomplished, at least in part, by using educational resources which highlight the benefits of disaster mitigation for overall national development, the links between disasters and development, and the links between the resolution of many basic health problems with a high priority for health preparedness, and disaster preparedness and mitigation. However, one thing that is clear is that PAHO/EPD needs to be able to decide at which point to stop putting significant levels of resources into countries with high vulnerability/low priority and to shift to those with high vulnerability/high priority. Even though such a critical-decision process is complicated by the necessary inclusion of all LAC countries in the Program, it is nevertheless essential that the Program aim for optimal cost effectiveness measures.

2. Support for Country-level Health Disaster Preparedness Programs

Description and Accomplishments

Support to national programs through technical assistance (TA) is generally excellent. None of the countries visited had major concerns that TA had not been met. All country disaster personnel interviewed, immediately identified PAHO/EPD as the principle source of TA, indicating that it is both responsive and flexible.

Issues and Recommendations

While TA is readily available, some of the country program offices do not even have computers. Since SUMA is a computer-based inventory program, it is difficult for country program managers to remain current on the SUMA without access to computer hardware. In addition, report-generation, production of manuals, and data analyses are difficult for country program offices in the absence of computers. At a minimum, each country office should have a computer as well as audiovisual equipment that can be used in training exercises.

It was learned that Honduras had requested a computer under PAHO/EPD funding but the request went unfilled. However, the provision of computers to country programs is not necessarily the role of the Program. In fact, it is probably incumbent on the country programs to have the material support of their governments, if for no other reason than as a sign of national leadership's commitment to disaster preparedness.

3. Preparedness Policy and Coordination

Description and Achievements

National emergency commissions (or their equivalent) exist in all four countries. These have multi-agency representation (including the health sector). In Costa Rica the Commission is a civilian-run institution, while in Honduras, El Salvador and Ecuador, lead status is assigned to the military or police-- the armed forces, Ministry of the Interior and Civil Defense, respectively.

These Commissions are responsible for the formulation of national disaster policy, plans and guidelines, as well as the overall coordination of disaster relief efforts. National disaster or emergency plans exist in most of the countries. Health preparedness plans exist in general, prepared by the institutions involved in emergency activities (Red Cross, MOHs, hospitals and University Medical Faculties). Since these plans are often agency-specific, they have not always been reviewed by the national emergency commissions.

Routine monitoring and evaluation of preparedness programs in the four countries is simply not done. This results in the absence of country priority to preparedness and, therefore, limited or no assignment of financial resources to the activity. Any evaluation of existing plans is limited by the lack of recent post-disaster evaluation studies. In the case of the recent 'La Josefina' landslide and flooding disaster in Cuenca, however, it was noted that the lead role for relief activities was placed in the hands of the military; for the post-disaster reconstruction efforts the President of the Republic assigned the lead to the Archdiocese of Cuenca. In both cases, Civil Defense was replaced as the coordinator of disaster efforts, illustrating the incipient development of a national coordination system.

Issues and Recommendations

With the clear exception of Costa Rica, no evidence was uncovered to suggest that disaster policy guidelines, programs and plans translate into an efficient, coordinated response in the face of a major sudden onset disaster. Deficiencies in logistics, coordination and even material resources are complicated by the fact that many public sector plans and policies are not amply disseminated among potential participants in disaster management. Plans have a tendency to be shelved or remain in the hands of a restricted number of persons with little follow-up in terms of implementation procedures, including simulation exercises. NGOs, such as the Red Cross, seem far better prepared to deal with emergency situations.

Based on the above conclusion, it is recommended, once PAHO has ascertained the level of member country government commitment to emergency health preparedness through a formal assessment, that it should focus on promoting activities that increase the planning, coordination, and implementation capacity of disaster assistance agencies in as many countries as possible. That is to say, it is essential to set in place the resources that enable disaster managers to convert plans into reality.

4. Intra-Regional Cooperation and Post-Disaster Evaluation

Description and Accomplishments

There appears to be extensive technical cooperation among countries in the region which results from PAHO/EPD technical assistance. An example is the immediate aftermath of last year's tidal wave in Nicaragua. Technical support for that came principally from El Salvador, Honduras and Costa Rica. During the course of the four country visits it was learned that consultants from each of the countries in the region were providing TA to other countries in training activities, and preparation of training material. This was also observed in the South American sub-region where local technical consultants were used. In addition, in that same sub-region there are bilateral activities conducted between Venezuela and Colombia; Colombia and Ecuador, Peru and Brazil; Ecuador and Peru; and Peru, Bolivia and Chile. Formal accords have been signed between Andean neighboring countries for technical cooperation in the field of disaster preparedness.

Issues and Recommendations

A major gap is the absence of a system for post-disaster "postmortem" evaluations. Cross-fertilization and participation of neighboring sub-regional countries in a second country's implementation of disaster relief is not routinely done. Thus there is the missed opportunity to learn from others' mistakes. The undertaking of in-depth, post-disaster postmortem studies would be very instructive. These would examine closely the response of the health sector in particular, and of other sectors in general, in the functioning of health institutions and personnel (logistical and transportation aspects, food distribution, refugee management, etc.). Such studies would optimally be multi-sectoral, and implemented on a inter-agency basis, with PAHO/EPD possibly taking the lead.

The results of postmortem evaluations would offer important orientations for ongoing EPD activities. These should be discussed in sub-regional or regional-level seminar work group sessions, thus guaranteeing their utility beyond the country where a disaster occurred. Such evaluations, jointly with training evaluations, would comprise part of a formal, permanent system of monitoring and evaluation, oriented to identifying and measuring impact indicators.

At present, what are labeled as EPD semester, annual, or biannual "evaluations" can more appropriately be called "activity reports". These reports concentrate on the process of assistance in contrast to measurable program results. A focus on periodic results and indicators of achievement would greatly facilitate reporting, as well as interim, end-of-program, and impact evaluations undertaken by donor agencies (e.g., OFDA, CIDA). Such a performance monitoring approach would become integral to the management process and also encourage more convincing reporting of results.

Contributing to the absence of a formal system for post-disaster evaluations is the unavailability of reporting generally on post-disasters. Thus, while there have been recent

disasters in each of the countries visited, formal post-disaster reports were not available for official review. The evaluation team learned that such reports were in preparation and others had been produced, but copies of the reports were unavailable.

D. Mass Casualty Management

1. Coordination of Health Sector Response to Emergency Situations

Description and Accomplishments

Traditionally PAHO/EPD works closely with Ministries of Health within the region, mainly in providing TA, training to health-specific programs, and human resource development. The PAHO/EPD program has expanded the traditional role of PAHO through its work with a range of participants in the health sector, many of whom are outside PAHO's usual channels. Thus, PAHO/EPD activities have included TA and training support for private sector organizations (Surgical Societies), non-governmental organizations (Red Cross, Partners of the Americas, Doctors Without Borders), in addition to the MOHs, Social Security and medical schools. By expanding the traditional role of PAHO in its work with a variety of participants, it has acknowledged that an MOH cannot possibly provide all the expertise necessary for an adequate preparation and response to disaster situations.

In none of the countries visited was the MOH the lead agency for coordination of health preparedness and relief activities. In Costa Rica, clinical care is provided primarily through Social Security, with the MOH playing a normative role. Thus, the clinical care providers in Costa Rica do not fall under the jurisdiction of the MOH, as in most of the other countries. While the MOH does serve a normative role for public health recommendations, any recommendations that relate to clinical care decisions and practice must be done in conjunction with the Social Security system. In keeping with this, the chairman of the national medical technical advisory group to the national Emergency Commission (CATSS) is from the Social Security Hospital system and not the MOH. In Honduras, El Salvador and Ecuador, clinical care is provided by the MOH with Social Security and the private sector playing much smaller roles. In Ecuador the MOH has developed health preparedness guidelines.

The Red Cross (or Green Cross in El Salvador) in most countries is responsible for pre-hospital attention. This includes ambulance and para-medical personnel for the country. While the Red Cross often participates on the National Emergency Committee, the MOH does not determine Red Cross activities and norms.

The move towards technical standardization and coordination in the health sector is most advanced in Costa Rica (through CATSS). El Salvador is moving in this direction through the existing inter-agency technical committee for disasters (COTIDE) and Honduras, through COPECO's inter-agency technical committee. While Costa Rica is the most advanced, Ecuador is least advanced in this respect.

Mass casualty management is coordinated by the emergency committees, with the Civil Defense (or its equivalent) as the lead agency. In Costa Rica, there is a committee of medical personnel representing the major providers of curative and preventive care (MOH and Directors of the main Social Security referral hospitals) that meets on a weekly basis.

Major on-site medical assistance is provided by the Red Cross, including primary ambulance service. All of the Red Cross National programs visited had either prepared manuals for managing disaster situations or were beginning preparation. This reflects a change in focus of the International Red Cross from primarily post-disaster intervention to prevention.

Issues and Recommendations

Within each country there are multiple agencies and organizations that participate in the immediate post-disaster period. These include the Red Cross, fire brigades, search and rescue teams, MOH personnel (physicians and nurses), private health care personnel and Social Security personnel. Given the variety of sectors involved in disaster response, a need exists for overall coordination of the efforts by a facilitator. In Costa Rica, this role is filled by the National Emergency Commission. In Honduras and El Salvador there are also national committees with participation of all sectors. In Ecuador the Civil Defense provides overall coordination, but the agency is still in its formative stage, especially for activities in provinces outside of Quito.

PAHO/EPD has played a prominent role in supporting the many sectors that participate in disaster prevention, mitigation and preparedness (PMP) activities. Although it might be logical, in developing a mechanism for overall coordination of the disaster PMP activities, that PAHO/EPD focus on those member countries that are identified as presently deficient. However, it is more practical, as suggested earlier, that PAHO/EPD focus on countries which give high priority to emergency health preparedness. It is those countries that there are the professional staff with whom the Program would naturally work.

2. Hospital Emergency Preparedness and Mass Casualty Management

Description and Accomplishments

Most of the countries visited were beginning to develop hospital emergency preparedness plans. In addition, the Red Cross Chapters in each of the countries were working on national disaster management plans, which included prevention strategies. Meetings with International Red Cross representatives in Costa Rica revealed that it is changing its focus from a primarily disaster relief organization to one of preparedness and prevention.

In Costa Rica, all hospitals within the national system (Social Security) were to have produced their own hospital emergency plan. In Honduras only two of the major hospitals have developed written hospital emergency plans.

In the countries visited, an assessment of the number of hospital beds available by region was conducted. In Costa Rica, well-defined hospital disaster plans were developed, including a national contingency plan for alternative hospital use in the event of destruction of hospitals. Development of similar plans was under way in the other countries. In El Salvador, the main pediatric referral hospital was destroyed during the 1987 earthquake. The renovated hospital was just inaugurated this year, and the hospital emergency preparedness plan is being finalized.

A major activity supported by PAHO/EPD is disaster drills conducted by each of the participating organizations. In all four countries, national medical schools were involved in annual disaster drills, thereby introducing training in mass casualty management in the formative stages of medical education.

Major referral hospitals in Costa Rica, Honduras and El Salvador had conducted at least one disaster drill, and plans were under way to expand these to hospitals in regions outside the capital cities. In Ecuador, the national plan included disaster drills as part of the training exercise of the referral hospitals. These activities had not yet gotten underway at the time of the evaluation. Some of the countries were conducting disaster drills in the major trauma receiving hospitals.

Pre-hospital attention is one of the focuses of PAHO/EPD training. The Red Cross and fire fighting emergency teams are the two main organizations involved in pre-hospital attention and, consequently, triage of casualties at disaster sites. The International Red Cross has produced a series of guidelines for mass casualty management and triage, which national chapters of the Red Cross have adopted. All countries visited cited triage and mass casualty management training of emergency management technician (EMT) personnel as a high priority. Furthermore, national Red Cross chapters were developing manuals and training personnel in disaster preparedness. Such training has included annual disaster drills for Red Cross personnel.

Issues and Recommendations

It is unclear how effective the hospital preparedness plans are. At the time of the evaluation none of the hospital-specific, emergency plans was available for review. Vulnerability studies of the hospitals have not been conducted on a regular basis in most of the countries. It was learned that while some hospitals had conducted these, they had not paid attention to access routes.

In their mass casualty management programs, few of the countries had central dispatch contingency plans to direct ambulances to the functioning hospitals. In addition, many of the country Red Cross personnel expressed concern that they functioned as a "taxi service," since appropriate emergency equipment for dealing with casualties was not available in the ambulances.

Reportedly, pre-hospital triage capabilities are still a weak link in the countries. This was consistently cited as a concern by both the pre-hospital attenders (Red Cross) and the medical personnel (the medical coordinating committee in Costa Rica, surgical society representatives, and medical school faculty members in each of the countries). While this was cited as a concern, formal evaluations of the skills of the EMTs had not been conducted. In Costa Rica, the national Red Cross Chapter was receiving assistance from PAHO/EPD as well as the American Red Cross in upgrading EMT skills.

A major weakness in the mass casualty management cited by the Red Cross personnel in each of the countries was a lack of adequate resources and material for on-site treatment of severe injuries. This ranged from limited equipment available in Costa Rica to nothing other than litter stretchers and ambulances in Honduras.

While the Red Cross is the primary provider of pre-hospital attention and mass casualty management, coverage within the countries is limited. In the best case example, Costa Rica, there were Red Cross units in each of the regions in the country. In Honduras four departments (approximately 25 percent) are not covered by the Red Cross. In El Salvador, all but one of the departments is covered by the Red Cross, in addition to 14 other NGOs, including the Green Cross. In Ecuador all but one (5 percent) of the provinces are covered by the Red Cross.

A more in-depth evaluation of the pre-hospital attention capabilities is needed. Officials highlighted triage and mass casualty management training of emergency management personnel as a high priority need. Their concern points to the need for participating country health authorities to review their concept and planning of pre-hospital preparedness generally. Perhaps in concert with interested donors, PAHO/EPD should therefore support an evaluative review of disaster pre-hospital attention capabilities. The evaluations should be stratified to address: (a) major metropolitan areas and their marginal zones; (b) secondary urban areas; and (c) rural areas.

To address the different situations in the member countries, the evaluation process should be a two-step process. The first step is to develop evaluation guidelines, which address minimum information needs. The second stage should be the actual evaluation, country-by-country.

The first stage will require technical expertise in the field of pre-hospital attention and paramedic system development. Second stage information-gathering can be conducted by each of the countries following training in how to implement evaluation guidelines, with subsequent technical assistance in reviewing each country's results, and assisting in the development of recommendations based on the findings.

3. Cooperation in Technical Training among Regional and International Organizations

Description and Achievements

The lead agencies for assistance in training activities within the field of disaster preparedness and prevention have been PAHO and OFDA. Other agencies have collaborated with both PAHO and OFDA in developing training activities and material. For example, Italian Cooperation has concentrated on the community level for disaster prevention activities, one result of which was a community-based manual produced in coordination with PAHO.

The International Red Cross and its national affiliates have been assuming a major role in the training of paramedical personnel for disaster preparedness. PAHO/EPD, OFDA and the American Red Cross have been major contributors to training of Red Cross personnel at the country level. In most countries visited, discussions with health care-related personnel in the public, private and NGO sectors revealed that all view PAHO/EPD as the lead agency for assistance in disaster health preparedness training.

Issues and Recommendations

In none of the countries visited were regular meetings held to bring together international participants in disaster PMP activities. The role of coordinating meetings with international participation in theory should be done by country personnel and not international agencies. On the other hand, PAHO/EPD, the most respected agency in the health sector in the Americas Region, might consider promotion among the participating countries of periodic interagency (donor) coordinating meetings with national emergency committees. Such meetings would probably enhance the possibility of coordination and consequent reduction of duplication.

Another recommendation is that PAHO/EPD headquarters promote consideration by donors of periodic coordinating meetings of international organizations involved in disaster PMP. One important outcome of this process would be guidelines for country and regional coordination by donors.

4. Cooperation among Emergency Medical Care Providers in Metropolitan Areas

Discussion and Achievements

In the countries visited, the primary emergency service for pre-hospital attention in both metropolitan and non-metropolitan areas was provided by the Red Cross Society. In Costa Rica, the primary hospital attention is provided by Social Security. In addition, as mentioned earlier, there is a national emergency medical coordinating committee that meets weekly.

In the other three countries, the primary providers of hospital-based medical care in metropolitan areas was divided between the MOH, SS and the private sector. None of the

other countries had a medical care coordinating committee such as Costa Rica. It was learned that in all countries, none of the health care providers, by law, could refuse emergency treatment to a patient if the patient was not covered by insurance of the institution where the patient was admitted.

Anecdotally, most of the medical faculty practiced in both the private and public sectors. In the countries visited, PAHO/EPD is attempting to work with national trauma surgeon societies to promote emergency attention to casualties. In Ecuador, concern was raised about the lack of norms for pre-hospital attention; a request was made to PAHO/EPD to sponsor training seminars with trauma surgeons and pre-hospital personnel (for example, Red Cross, Armed Forces, Civil Defense).

Issues and Recommendations

Not all of the metropolitan areas in the countries visited had a central coordinating unit to direct paramedical personnel in the field. Within the major urban areas in each country, clinical care is provided by both public and private sectors. As with other health programs (such as immunization activities), coordination with the private sector from PMP-related activities in most countries is on an unofficial, voluntary basis. Since some of the leading trauma centers in major urban areas are private, their participation in planning activities is critical to coordination during actual emergency situations.

The following recommendation concerns the improvement in coordination of emergency medical care providers in metropolitan areas. The earlier-proposed evaluation of pre-hospital attention should include participation of the Emergency Medical Services (paramedics, such as the Red Cross) and emergency services physicians (such as the trauma or emergency medicine societies). Physicians should be selected from both public and private sector institutions.

E. Field Assessment of Health Needs

1. Rapid Epidemiological Assessments

Description and Achievements

The need for epidemiological assessments has been addressed by PAHO/EPD in a variety of ways. In 1983 the Program developed a manual addressing the subject. A working paper on post-disaster surveillance needs has also been prepared and distributed. A regional course on rapid epidemiological assessments was held.

These assessments have been used to identify basic health, sanitation and other material needs, as well as to monitor changing needs in the post-disaster period. In the countries visited, the MOH has the responsibility for the disease surveillance activities following the occurrence of emergency situations.

In Costa Rica, a team from the National Emergency Committee, in coordination with PAHO/EPD and OFDA, is responsible for initial field needs assessments. These assessments address health, water, sanitation and housing needs. In Honduras, El Salvador and Ecuador, the Civil Defense, with the participation of MOH personnel, is responsible for needs assessment of disasters.

Special mention is made of cholera preparedness activities in the region. After the identification of *Vibrio cholera* activity in Peru in 1991, PAHO/EPD activated a region-wide cholera prevention program. This program included numerous training courses at the regional and country levels, so that most health care providers in the public and private sector were trained in the early recognition of cholera. Providers were also given appropriate training in clinical management of cases. In addition, stocking of medical supplies was guaranteed at central, regional and local health facilities in each of the countries.

In the Peruvian case, cholera preparedness was coordinated by PAHO epidemiologists, Diarrheal Disease Control Program personnel and PAHO/EPD personnel. Cholera prevention in the four countries visited was cited as part of the disaster program. The MOH had the lead role in implementation of cholera control activities in each country. In Costa Rica, El Salvador and Ecuador, the activities were coordinated by the MOH diarrheal disease control program and division of epidemiology, while in Honduras they were directed by the MOH disaster preparedness unit. This example is an excellent model for other coordination efforts, including implementation of rapid assessment methodologies.

Of the four countries visited, Costa Rica is the only one with a well developed field epidemiology assessment team at the central, regional, and local levels. In addition, there is a multi-sectoral team scheduled to mobilize immediately to assess the immediate post-disaster phase of recent disasters.

Issues and Recommendations

In none of the countries visited were there guidelines for rapid assessment of health/sanitation needs following disasters. In Honduras, the response is to increase routine surveillance activities with attention to potential epidemic diseases such as water-borne, vector-borne, and vaccine-preventable diseases. In Ecuador, active surveillance of health facilities is conducted to follow the trends in reportable diseases. Costa Rica is the only country in which community-based assessments of health problems was conducted in the post-disaster period (which, for example, identified an increase in malaria in Limon following the earthquake).

The absence of community-based assessments is of concern. It is recognized that many common health problems do not make themselves readily known and thus observable to health specialists, especially those occurring among lower socioeconomic populations. Thus, a reliance on health facility surveillance data is less than optimal in emergency situations, especially when the populations most affected tend to be those whose health pictures are not readily available.

A concern that arose during the evaluation is that many national and international disaster preparedness personnel interpret rapid epidemiologic assessment only to mean identification of outbreaks of food and water-borne disease, such as typhoid fever. The literature now demonstrates that these outbreaks do not occur in the immediate post-disaster stage; thus, the general feeling is that special, "disaster epidemiology" and surveillance is not needed. With the introduction of cholera to the region in 1991, concern must now be given to increasing the monitoring of water and sanitation, as well as early detection of *Vibrio cholera* activity in affected and surrounding areas.

Epidemiologic assessments are also useful in identifying risk factors for injury both to people and structures. A good example of this was the discovery of building code violations in Mexico City that contributed to loss of structures during the earthquake. It was through an epidemiologic study that buildings constructed during a specified timeframe were identified as at highest risk of damage during the earthquake. Consideration should be given to an evaluation of the field epidemiology capabilities of the countries. This could be done by the epidemiology units in the country in cooperation with PAHO/EPD.

Future focus should include development by PAHO/EPD of rapid assessment guidelines with training of national, regional and local personnel in the use of cluster sampling methodology. This methodology would be applied to immediate post disaster situations as well as periodic reassessments during the few weeks following the disaster, to the point that the situation normalizes.

As discussed elsewhere, the SUMA project is presently oriented towards an inventory of relief supply flow in the post-disaster period. That is the function originally envisioned for this project. As a future effort, consideration might be given to the development of a predictive component to the SUMA software that includes a demand-driven orientation. Such an adaptation of the SUMA software would support the post-disaster relief effort and minimize unmet needs.

2. Flow of Health/Medical Information

Description and Achievements

PAHO/EPD, through the SUMA project, is assuming a lead role in the coordination of post-disaster resources. While there is national coordination of relief efforts, the integration of NGO donations does not always occur smoothly. Most countries have been trained in the use of SUMA, whose project software was used in the response to the Nicaragua Tidal Wave and the Cuenca Ecuador landslides. Preliminary reports from both are that the system proved effective in the management of relief supplies. Of note in the case of the Ecuador landslide, very little material was brought in from outside the country but rather money was requested and the supplies were purchased locally.

The Program has emphasized the training of Ministry of Foreign Affairs personnel in appropriate post-disaster response, including how to manage requests and offers. The purported appropriateness of the response in both the Nicaragua and Ecuador events in the past year is attributable in part to coordination of host country requests and donor-country offers.

Reporting on disaster events occurs in the following manner: a team of PAHO/EPD and OFDA personnel, often in concert with national emergency committee members, mobilize at the disaster site; situation reports which assess damage are produced by U.N. agencies on a regular basis. These reports are distributed to interested parties in the region (e.g., the U.N. wrote situation reports for the Limon, Costa Rica Earthquake and the Cuenca Ecuador flooding and landslides). They included assessments of the events, identified needs, and donations/assistance provided.

This approach theoretically results in the elimination of duplication and maximizing of relief assistance and supplies.

Issues and Recommendations

As discussed in greater detail in an earlier section, there is not a uniform capacity within the region for rapid, post-disaster needs assessment.

A preliminary review of the SUMA software package reveals that it is oriented towards the tracking of all relief supplies destined for the country, once those supplies are identified and received at the international port of entry. At present the SUMA software does not contain a predictive component to identify needs, should a potential donor seek information on unmet needs. In fact it was intended to solve the problem of inventorying supplies, not of meeting unmet demand. However, recognizing that the SUMA project is in the early stages of implementation, this recommendation is directed to the future. Consideration should be given to a reorientation of SUMA to determine supply deficits. Furthermore, to foster an improved exchange of information on supplies both during and following emergency situations, PAHO/EPD-SUMA should focus on coordination of international agencies both in-country and regionally.

F. Cooperation with Other Regions

1. Collaboration with World Health Organization

Description and Achievements

Regional personnel have participated in disaster preparedness/EPD meetings in other (than LAC) regions. Most disaster preparedness and prevention training material was produced by PAHO and distributed by the parent organization, World Health Organization (WHO), in other regions where it has a presence.

An excellent example of cooperation with other regions is the PAHO/EPD-sponsored *Disaster* newsletter. It is presently published in Spanish and English and has a wide distribution in and outside the Americas. Plans are afoot to translate the newsletter into French to increase its distribution in Africa. Personnel in other regions receive *Disaster*, including WHO personnel and country program directors and interested individuals in other sectors.

PAHO personnel are invited to attend disaster PMP meetings in other WHO regions and participate in international fora. The status of PMP activities in Americas Regional Office (AMRO) is presented at the other regional meetings.

2. Success of Exchange Visits by National Disaster Coordinators and Provision of Consultant Services

Description and Accomplishments

Consultants from the region are readily available when requested, within the region, and consultants from other regions have been loaned to the region. Thus, Japanese, Dutch and French consultants are provided by their respective governments. Within the region, a cadre of PMP experts is available. The PAHO sub-regional offices tend to draw on the pool of local consultants when requested within the region. A roster of AMRO personnel with language skills of relevance to other regions has been established. This has resulted, for example, in Brazilians serving as consultants to Portuguese-speaking Africa (i.e., Mozambique and Angola).

Issues and Recommendations

To present, national disaster program coordinators have not participated in many activities outside their own countries. They do not meet following a disaster to participate in post-disaster postmortems. However, there is an expressed desire to conduct such meetings at a sub-regional level to foster the interchange of ideas and practices. To the extent that it is within PAHO/EPD's management capability, it should promote such meetings.

V. CONCLUSIONS

Overall this evaluation indicates that PAHO/EPD has achieved positive results in the health emergency preparedness arena. In certain key areas, such as education and training, results are quite successful. In others, especially mass casualty management, progress is poor and in need of a boost. Whether the program is more or less successful, however, depends in part on its being tailored to a country's specific emergency preparedness needs. The extent to which these needs are developed, in turn, depend on the degree of political priority (i.e., resources) governments give to preparedness.

In general, the evaluation has found that the PAHO emergency health preparedness program could benefit from even greater decentralization and tailoring of its program to countries with

high vulnerability and high priority in preparedness. Part of the tailoring function requires, first, however, that LAC countries receive support from the Program in institutionalizing policy planning, design and administration of emergency preparedness practices. Simultaneously, PAHO/EPD might then be able to phase out direct support of successful country preparedness programs. A consequence would be that successful countries could, through PAHO/EPD, lend their technical support to the others.

ANNEX A

Benchmarks of Achievement in Disaster Health Preparedness

In a CIDA evaluation conducted in 1990, an evaluation matrix was developed. This matrix identified key program activities to be assessed in each country in terms of their program status. The present evaluation team decided not to use the matrix approach, but rather to look at the overall program, then develop a simple, preliminary checklist of possible benchmarks to measure progress towards disaster health preparedness achievements.

In the absence of an actual disaster, benchmarks have been somewhat difficult to identify. The development of these for periodic monitoring and evaluation is of interest to both PAHO/EPD and OFDA. Preliminary discussions suggested both an interest and need for benchmarks.

The evaluation team has developed some preliminary suggestions for process indicators or benchmarks that can be used for monitoring activities in the region. It recommends that the earlier-proposed, post-disaster postmortems would be an ideal source for the identification and refinement of measures. These benchmarks should be of value in determining progress of disaster PMP activities. During the course of the post-disaster postmortems the validity and usefulness of the suggested benchmarks might be tested. Additional measures can be identified during this process.

The following list represents a very preliminary cut at developing benchmarks of progress in disaster health preparedness. They are intended to be suggestive, to promote discussion, and are in no way definitive.

**A Preliminary Checklist of
Disaster Health Preparedness Benchmarks**

- I. Overall project management and evaluation
 - a. Is there a National Emergency Committee (or Commission)?
 - 1) How frequently does it meet?
 - 2) Who are the members?
 - b. Is there national support of Disaster PMP activities?
 - c. What is the annual national budget for Disaster PMP activities?
 - 1) For MOH Disaster PMP activities?
 - 2) For National Emergency Committee?
 - 3) For Civil Defense?
 - d. For each Disaster in the past five years:
 - 1) Was there a post disaster evaluation?
 - 2) Was a report produced?
 - 3) Was there follow-up to check if recommendations were implemented?
 - 4) What was the recommendation implementation completion rate?

- II. Educational training materials
 - a. How many disaster related publications have been released by PAHO in the past five years?
 - b. What has been the unsolicited distribution of the publications (by affiliation and country).
 - c. What is the solicitation rate from the CDD by affiliation and country during the past three years?

- III. Support to national programs
 - a. How many training courses have been funded by PAHO during the past five years?
 - b. Who attended each course (number by title, post, discipline and organization or affiliation)?
 - 1) Where are these people working today?
 - 2) What are their positions?
 - 3) Percentage drop-out from disaster PMP job related activity.

- IV. Mass casualty management
 - a. Who has the lead role for pre-hospital casualty management?
 - b. Are there formal guidelines for pre-hospital casualty management?
 - c. Have the pre-hospital agency personnel received training in triage?
 - 1) Percent of personnel trained.
 - 2) When was the last training in triage conducted?
 - d. Is there a national plan of action for mass casualties?
 - f. Which agencies participated in the development of the national plan?
 - g. Are there regional teams trained in mass casualty management?

- h. How many hospitals are there in the country by region?
 - 1) How many hospitals have developed a hospital disaster plan? (Percent completion rate)
 - 2) How many hospitals have conducted vulnerability studies?

- V. Field assessment of health needs
 - a. Is there a rapid assessment field epidemiology team at the national, regional, local level in a country?
 - b. During the last five years, what were the methodologies used to identify health, water and sanitation needs in populations affected by disasters?
 - c. Were reports prepared that detail identified health, water and sanitation needs?
 - d. In countries where routine surveillance activities were increased, what is the status of routine surveillance activities? Are the surveillance systems sensitive?
 - e. During cholera activity in the country since 1991:
 - 1) What percent of reported cholera cases were laboratory confirmed?
 - 2) What percent of reported suspected cases were discarded due to absence of laboratory confirmation?

- VI. Cooperation with other regions
 - a. How many international conferences outside of AMRO were attended by PAHO Regional Staff?
 - 1) By PAHO sub-regional staff?
 - 2) By country program personnel?
 - b. How many copies of *Disasters* are sent to non-AMRO countries?
 - c. How many copies of *Disasters* are sent to non-AMRO country program managers? (Percent of non-AMRO countries receiving *Disasters* newsletter).
 - d. How many post-disaster assessments in non-AMRO countries have been attended by:
 - 1) PAHO regional staff?
 - 2) PAHO sub-regional staff?
 - 3) AMRO country program directors?

- VII. Other indicators/questions to be addressed?
 - a. What is the budgetary process for PAHO activities?
 - 1) What is the budgetary commitment of external assistance by agency?
 - 2) What is the lead time for budgetary allocation by agency?
 - b. Are there constraints in planning due to insecure budgetary allocation?

ANNEX B

STATEMENT OF WORK

Evaluation of Emergency Preparedness and Disaster Relief Coordination Project

I. Purpose

The purpose of this evaluation is to:

1. Provide a review of information and evaluative analysis of the present status of the project towards the objective of determining whether the project is fulfilling its intended purpose.
2. Render an evaluative analysis of the impact of the project on the effectiveness of the country health sector contribution to programs primarily in emergency preparedness and secondarily in response. (Effectiveness = achievement of satisfactory progress towards stated objectives.)
3. Analyze how effectively and efficiently the project is in dealing with the constraints to country program achievement of preparedness and response in a sustainable manner. (Efficiency = at an acceptable cost compared with alternative approaches to accomplishing the same objectives.)
4. Assist the implementing agency, Ministries of Health, USAIDs, NGOs, and private firms by proposing solutions, technical and institutional-organizational, to the constraints of coordinating health sector preparedness and response.
5. Extract lessons learned that will assist the implementing agency in developing criteria for the purpose of tracking country program progress consistently over time, including criteria for phasing assistance to moderate, low and zero funding levels.
6. Build, in a collaborative fashion with PAHO and country program officials, on existing indicators of performance results through developing and testing new indicators that underscore mid-to-long term impact, in terms of people-level impact, institution-building capacity, and phasing of donor or donor-coordinated support. (Impact = positive and negative effects resulting from the project.)

II. Background

The purpose of the Emergency Preparedness and Disaster Relief Coordination Project (EPDRC), implemented by Pan American Health Organization (PAHO), is to:

--promote and support the establishment or strengthening of a technical program in the Ministry of Health responsible for ongoing pre-disaster planning and coordination of relief activities of the health sector in case of natural or manmade disaster;
--promote and support the training of the human resources required for an effective health response to emergency situations; and
--stimulate close cooperation between the Ministry of Health, other health institutions, non-governmental organizations, the civil defense and the representatives of the international community both before and during emergency situations caused by natural and manmade disasters.

In the broad context, the project is a response to Latin American and Caribbean (LAC) countries' increasing vulnerability to natural and manmade disasters resulting from an increase in population and human settlements occurring in high risk areas. In the narrow context, the project is designed to identify and respond to needs and requests expressed by disaster prone countries for technical assistance in improving the health sector's response to major disasters. PAHO's role as a specialized technical agency in the health field is to support LAC national health sectors in emergency preparedness. PAHO supports the health sector so that this sector can face more rapidly and efficiently the health problems in the aftermath of almost any type of disaster.

The project has been largely supported by the Canadian International Development Agency, with approximately 20% funding by the Agency for International Development (A.I.D.), through its Office of Foreign Disaster (OFDA). OFDA's funding is directed more at support of the preparedness than the response activity.

Components of the Project are: (1) Overall Project Management and Evaluation, (2) Educational/Training Materials, (3) Support to National Programs, (4) Hospital Preparedness, (5) Training of Environmental Health Professionals, (6) Field Assessment of Health Needs, (7) Technological Disasters, and (8) Cooperation with other WHO Regions. OFDA's support is mainly directed towards numbers 1-4 and 6, while numbers 5 and 7 are not of direct interest.

Expected outcomes of the Project are, among others:

--acceptance by participating countries of the need for a national preparedness program
--progress in the development of such a program
--improved techniques, staff training, and hospital preparedness in responding to major accidents
--training courses in disaster management and environmental health, including use of materials published through the program in curricula of training institutions and universities

III. Scope of Work

The evaluation of the Emergency Preparedness and Disaster Relief Coordination Project will be carried out in Costa Rica, Ecuador, El Salvador, and Honduras within the timeframe of June 30-July, 26 1993.

A. Focal Points and Key Evaluation Questions

Several points of focus and key evaluation questions based on the definition of project components and activities outlined below should be evaluated from the perspective of (1) people-level impact and (2) and institution/organization-building capacity. While the focal points of the project are by no means mutually exclusive, to the extent practical each should be observed and evaluated separately by, respectively, the specialist in disaster epidemiology and the evaluation/institution-building/training specialist. Attention will be given to the application and development of performance indicators in evaluating these components. The focal points of this evaluation and the key questions are as follows:

- 1. Focal Point** Management: The extent to which the project has been supportive of national health and related preparedness and response institutions

Questions (a) how effective is the formulation and implementation of preparedness and response policies and guidelines?
(b) how effective is the planning, management, and monitoring and evaluating of preparedness programs and activities from technical and managerial perspectives?
- 2. Focal Point** Education and Training: How effectively the project has supported country institution development of key functions

Questions (a) how adequate is the technical and scientific base in preparedness and relief management in the health field?
(b) how well developed are the informational and training materials for health and related professionals?
(c) how effective are the educational programs in raising general public awareness in the essentials of disaster preparedness?
- 3. Focal Point** National/Regional Response to Disasters: The capacity of national and regional health sector programs in emergency preparedness and response.

Questions (a) how responsive is PAHO technical and material assistance to the needs of country-level health disaster preparedness programs? (b) what is the level of priority assigned to health preparedness by high national authorities?

- (c) what is the extent of technical cooperation among countries in the region in context of PAHO technical assistance?
- (d) what is the quality of coordination and technical standardization by Ministries of Health of all private and public sector contributions to health preparedness and relief activities?

4. Focal Point Mass Casualty Management -- Hospital (but including other health care institution) preparedness to respond to mass casualties on-site and in hospital facilities

- Questions**
- (a) what is the capacity to technically plan and implement hospital emergency preparedness and mass casualty management?
 - (b) what is the degree and quality of cooperation among regional and international organizations and agencies in technical training?
 - (c) what is the extent and quality of cooperation among emergency medical care providers in metropolitan areas?

5. Focal Point Communication of Health Needs Information: Communications among national health institutions/emergency preparedness-response institutions in order to better use technical information in decision-making (Disaster Information Center; SUMA -- computerized logistical data base)

- Questions**
- (a) how effective is the flow of information based on immediate post-disaster needs assessments, educating public and media, and the PAHO-based information exchange system?
 - (b) what is the extent and quality of international agency cooperation in assessment and dissemination of disaster-related health needs information?

6. Focal Point Inter-Regional Cooperation: Exchange of experience between LAC and other regions in order to strengthen regional and national health disaster preparedness programs

- Questions**
- (a) what is the degree and quality of collaboration with other World Health Organization regions in exchange of information on experience, particularly country experience in managing such programs?
 - (b) how successful is the exchange of visits by national disaster coordinators and provision, on request, of consultants' services?

B. Development of Indicators

A special concern of this evaluation is the collaborative development of meaningful and useful indicators of performance or results. This concern is intended to help PAHO and participating countries institutions in coordinating emergency preparedness and disaster relief programs and in managing those programs for results. Probably the critical guiding question here is "what

constraints must PAHO overcome if it is to achieve its intended results?" The concern with indicators is also intended to help OFDA in making the choices of where to invest its funds in support of multilateral efforts in relief and preparedness. Furthermore, attention to indicators will also be useful to OFDA in monitoring and evaluating PMP's program support.

Indicators which are integral to managing performance in the area of preparedness and response are presently not well developed. An impact indicator such as "lives saved" would seem to be and, for certain purposes, is a significant indicator. How that kind of measure will directly aid PAHO, participating country relief and preparedness officials, or OFDA in managing programs is not altogether clear. That situation would suggest that some emphasis needs to be placed on developing lower-than-impact-level or intermediate indicators of program results. These are indicators lying on a continuum somewhere between impact and input measures. Examples of input indicators are "number of professionals exposed to new concepts of mitigation" and "number of persons trained in mitigation practices." These are useful for project monitoring and management purposes, though not necessarily useful for managing longer-term results.

An example of an intermediate measure (at least for some participating countries) might be "key disaster areas identified." This could be labeled a measure of institutional development, since it reflects the capacity to carry out a complex set of technical-professional actions. Logically related are indicators demonstrating that disaster areas are being monitored, e.g., "level and type of resources devoted to monitoring disaster areas" or "a disaster information response system with designated trigger points in place." An example of a logistics-effectiveness measure might be "extent of post-disaster homelessness," an indicator of the speed and adequacy of response. A combined logistics-institutional measure might be "correct skills mix resourced for response to disaster." Longer-term measures are useful in managing such areas as basic health needs, as in the earlier example, "lives saved" or "reduced level of illness."

The consultants will, in the context of the above discussion of indicators, work with PAHO/Washington and participating country officials in developing several salient indicators for each of the focus areas and in response to the key questions posed in III A.

IV. Evaluation Approach and Methodology

This evaluation combines elements of both a formative or process evaluation and an impact evaluation. These are defined briefly in the context of the EPDRC Project evaluation.

Formative evaluation -- an evaluation for the purpose of determining progress of a project still underway so that lessons learned can be applied; usually participatory and attempts to rely on stakeholders as important source of information and interpretation.

Impact Evaluation -- an evaluation for determining longer term positive and negative effects of a project or program; purpose is to provide managers with analyses of the results of activities and of issues related to an agency's or organization's assistance policies.

The methodology includes review of relevant documentation; review and analysis of any relevant statistical data; interviews with assistance agency officials in Washington and in-country; interviews with host-country officials and staff who are directly implementing project components; site visits for purpose of observing process and results of project component activities; application and development of performance indicators (see III. B.)

V. Evaluation and Team Composition

The evaluation requires two consultants, as follows:

- one specialist in health/epidemiology who must carry out evaluative research and analysis of health preparedness conditions in developing country institutions and be familiar with the A.I.D. project and program cycle
- one specialist in evaluation, institution development, and training who must carry out evaluative research and analysis of developing country health institutional and organizational support of preparedness and response

For purposes of team leadership, the health specialist/ epidemiologist will be designated as team leader for the consultancy.

VI. Logistics and Scheduling

Prior to the field component of the evaluation, the consultants will spend two days in Washington, D.C. to work with the contractor to detail their functions and schedules, meet with A.I.D. and PAHO officials for informational purposes and, review relevant documentation. At that time country visit schedules will be reviewed with the consultants. These visits and appointments with key institutions, agencies and organizations will be set up in advance. The fieldwork portion will be carried out in approximately 20 working days and finalization of the report in Washington five working days. A total of 30 working days is devoted to the evaluation. The consultants' collaboratively-written and integrated report will be presented as their final draft prior to or at the end of the 30 day period.

VII. Reporting Requirements

The final report must be completed and approved by August 13, 1993.

VIII. Work Plan

A detailed work plan for the health specialist/epidemiologist and the evaluation/institution-building specialist will be developed with the consultants during their Washington visit. By that time the sequence of country visits will have been decided and detailed schedules of work can then be determined.

Filename: PAHOWSOW (John P. Mason 5/29/93)

**ANNEX C
PERSONS INTERVIEWED**

WASHINGTON, DC

Dr. Claude deVille, Director PED/PAHO

Pat Bittner, PED/PAHO

Jose Luis Zeballos, Epidemiologist/PED/PAHO

Barry N.Heyman PhD, Assistant Director Prevention,
Mitigation and Preparedness OFDA/USAID

John Mason, BHM

Brad Michaels, BHM

COSTA RICA

M.Sc. Luis Diego Morales, National Emergency Commission

Paul Bell, OFDA/USAID Regional Advisor

Ricardo Bermudez, OFDA/USAID

Dr. Hugo Prado, Regional Advisor/PAHO/PED

Ms. Elle Vissner, PAHO

Dr. Eduardo Acosta, PAHO/SUMA project

Ms. Helena Molin Valdes, IDNRD/ Regional Program LAC

Dr. Maranghelo, Ministry of Health Epidemiologic Surveillance

Dr. William Vargas, University of Costa Rica

Dr. Contreras, Ministry of Health Planning Division/Disaster Preparedness

Dr. Roberto Sayers, Director Hospital de Limon/Social Security

Dr. Roberto Galva, Director Hospital de Alajuela
CATSS members

Rene Carrillo, OFDA/AID South American Advisor

Sr. Juan Luis Contreras (representing Sr. Miguel Carmona, President), Red Cross Costa Rica

Dr. Francisco Carrallo, Red Cross Costa Rica

Sr. Gustavo Ramirez, Red Cross International/LAC Regional Office

Dr. Isabela Barrientos, Red Cross International/LAC Regional Office

Dr. Rodriguez, Social Security/Costa Rica National Level

Dr. Ruiz, Social Security/Costa Rica National Level

Dr. William Vargas, Public Health, University of Costa Rica

Lic. Ricardo Perez, Documentation Center

Dr. Luis Paulino Hernandez, Director Hospital Calderon Guardino

M.Sc. Gabriel Mejia, Director del Trabajo Comunal Universitario.
(T.C.U.) Vicerectoria de Accion Social. Universidad de Costa Rica.

Dr. Pena, PAHO WPR Costa Rica (by telephone)

HONDURAS

Autoridades de COPECO

Dr. Ricardo Ochoa Alcantara, Ministry of Health

Dr. Godofredo Andino, Ministry of Health/Disaster Preparedness/GTI

Lic. Jorge A. Aldana, COPECO/GTI

Ing. Dario R. Ciliz, UNAH/GTI

Bassya Rafaelia Avilez, Ministry of Health/GTI

Kenia Marina Caceres, SECPLAN/GTI

Maruicio Ricardo Aguilar Robles, Ministry of Foreign Affairs/GTI

Maria Elisa Alvarado, Red Cross Honduras/GTI

Will Renan Diaz, Ministry of Education/Department of Environmental Education/GTI

Jose Maria Navarro, Red Cross Honduras/GTI

Rodil Henriquez, COPECO/GTI

Oscar E. Fernandez, Red Cross Honduras/GTI

Ing. Roberto Demas Alonzo, Vice President CEPREDENAC
(Coordinating center for prevention of natural disasters in Central America)

Ing. Ernesto Rojas, USAID/OFDA

Ing. Carlos Flores, USAID/OFDA
Vice Minister of Foreign Affairs

Katia Cooper, UNDP Honduras

Dr. Cesar Hermida, PAHO WPR-Honduras

Ing. Maricio Aguilar, National Autonomous University of Honduras

Ing. Alina Aguirie Mejia, UNAH/Engineering Faculty

Ing. Dario Roberto Calix, UNAH/Office of Scientific Investigation

Dr. Marco A. Zuniga, UNAH Geophysics/Physics Faculty

Inf. Juan Ramon Elvir, UNAH/Rectory

EL SALVADOR

Dr. Villegas, PWR-El Salvador

Dr. Valencia, PAHO

R. Prospero, PAHO

Ing. Nunez, PAHO

Dra. Delmy Zelaya de Hernandez, MSPAS
Sr. Reynaldo Cordova, COEN
Dr. Rafael Antonio Narvaez, Vision Mundial
Dr. Luis Antonio Villatoro, Director Bloom Pediatric Hospital
Lic Nelson Amaya Larromana, Ministry of Foreign Affairs
Lic. Abigail Castro de Perez, Ministry of Education
Lic. Gladys de Cortez, Ministry of Education
Ing. Carlos Adrian, Ministry of Education
Dr. Antonio Luzi, Italian Cooperation
Lic. Lidia Esperanza Castillo, Director CEPRODE
Sr. Juan Antonio Sibrian, Red Cross El Salvador
Lic. Sergio David Gutierrez, Red Cross El Salvador
Dr. Carolina Paz Paredes, Facultad de Medicina - UES

ECUADOR

Dr. Luis Jorge Perez, PAHO/SubRegional PED
Lic. Vanessa Rosales, PAHO
Dr. Italo Barragan, PAHO WPR-Ecuador
Dr. Jose Vincente Cedeno, Ministry of Public Health
Dr. Ramiro Estrella, Central University of Ecuador
Dr. Hernando Rosero, Central University of Ecuador
Dr. Guillermo Troya, University of the Andes
Dr. Minard Hall, National Politechnical School

Ing. Maria Augusta Fernandez, OFDA/USAID

Sonny Low, OFDA/USAID

Dr. Hugo Merino, Red Cross Ecuador

Ambassador Manuel Romero, Chancellery

Dr. Ricardo Mena, Partners of the Americas

Yolanda Dubois, PNUD/Ecuador

Gen. Edgar Vasconez, Civil Defense

Lic. Fernando Molina, Civil Defense

Dr. Luis Granja, Ecuadorian Trauma Society

Sr. Alejandro Santander, Red Cross Ecuador/Director of EMTs

Dr. Nelo Manciatti, Trauma Surgeon, Pablo Arturo Suarez Hospital

Ing. Agustin Rengel, ETAPA (phone interview)

Ing. Hugo Cobo, ETAPA (phone interview)