

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.