anti-hypertension (Aldomet) tablets were sent, particularly considering the potentially serious side-effects of this medication. It was wise to include intravenous equipment and solutions for anti-shock treatment and rehydration, but this should have been supplemented by oral rehydration supplies that can be administered easily at the village level. This is particularly important in a country where malnourished children are common, because of their extreme vulnerability to rapid dehydration as a product of diarrheal diseases.

Considering the high index of endemic gastro-intestinal infections and the kind of water system disturbances and crowding caused by hurricanes, the medicines sent should have also included metronidazole (Flagyl) and tetracycline. For malaria, chloroquine or quinacrine should have been included in the emergency shipments. Later shipments by other sources included typhoid vaccine, which might have been useful if applied correctly in conjunction with good epidemiologic surveillance. The case of the province of Estrelleta demonstrates that this did not sufficiently happen. It is unknown whether emergency shipments of immune serum globulin (for hepatitis) or fresh measles vaccines were received.

On a general level, the trauma and emergency care efforts were as good as could be expected, considering the poverty of the country and the magnitude of the event. Because of these two factors, and the widespread road destruction that occurred, many poor rural areas went without adequate post-disaster health care.

If the Dominican government had allowed foreign medical teams to enter the country, bringing their own supplies, it is possible that they

could have alleviated some of the problems of inadequate emergency care to poorly accessible areas. It would have been more likely that medical care providers could then have stayed in place longer than a day or two. But the mass convergence of outside medical groups would have inevitably caused logistical problems in planning and transportation at a time when the logistics of the relief effort were already complicated.

The basic trauma care and emergency medical problems were not caused by a lack of outside help, but rather by long-term Dominican problems. The Ministry of Public Health was probably correct in stating that the country had sufficient medical care practitioners to handle the health effects of the hurricanes. However, the chronic problem of a severe maldistribution of physicians in the country became even more extreme when the bulk of the disaster health impacts occurred outside of Santo Domingo and Santiago, where most physicians live and practice. The government had neither the physical facilities nor logistical capacity to temporarily re-distribute physician services where they were most needed. (There is also some question about the lack of political will to effect such a re-distribution of medical resources, however temporary).

At the local level, first aid and emergency care were often not available in the post-disaster period, because they are never available. The Dominican Republic has been severely lacking in the widespread teaching of first aid and rudamentary medical care at the village or community level. As a result, when disasterous events happen, the locality is not self-sufficient and must wait for outside assistance to arrive. This may be changing slowly with the growing implementation of

the health promoter program in rural areas, but as of this research, the above program did not include a strong first aid component.

Lastly, but of high importance, is the country's chronic maldistribution of drugs and other medical supplies. Many rural clinics are almost totally bereft of drugs, surgical and bandaging supplies in the best of times. When a disaster occurs, what meager supplies exist are soon depleted and medical aid personnel are left without the basic healing tools.

Disease Control and Nutrition: First Two Weeks

The most common diseases reported in the two-week survey were: 1) colds, with 26.1% of the reporting families; 2) undefined fevers (24.9%); 3) diarrhea (9.2%); 4) vomiting with diarrhea (9.0%); and suspected measles (8.8%). For these problems the proper disease control response would have been: 1) epidemiologic surveillance; 2) diagnosis and treatment of all suspected cases; 3) separation of cases from vulnerable population, including more generalized population dispersion; 4) provision of safe potable water and encourage good sanitation habits, and; 5) innoculate, where appropriate.

As previously mentioned, the epidemiologic surveillance during the first two weeks was spotty, at best, although the normal diagnostic report system continued to function. It consisted mainly of doing spot checks of rumored measles outbreaks and gastro-intestinal diseases. The measles investigations, some of which were done by the AID health director, moved quickly and often revealed that the rashes were the

result of other pathologies -- sometimes scabies.[13] The gastroenteritis investigations moved slowly and culminated in internal reports. During this time, the Dominican health authorities began to confer with U.S. and PAHO authorities about post-disaster public health planning.

The diagnosis and treatment of suspected cases depended on the resources of the locality and on the accessibility to the locality by outside health care practitioners. In the three study populations of the community survey, an average of 90.0% of those who reported illness in the immediate post-disaster period sought medical care, and an average of 96% of those who sought care received it. It must, however, be remembered that each of these communities had a standing clinic which was staffed at the time of the hurricanes. Of those who received medical care, 87.8% reported that the care they received was sufficient to cure their complaints. This is not unexpectedly high, since the great majority of complaints were probably due to self-limiting conditions that would have "cured" themselves without assistance.

Most of the area of the country which was heavily affected by the hurricanes was not made up of communities with standing clinics. In these areas, whatever medical care was given in the first two weeks was predominantly directed at treating trauma-induced problems. Diagnosis and treatment, with the aim of promoting disease control, was often not possible because of the health care teams' short tenure in each locality. Little, if anything, was done to separate disease "cases" from the rest of the population because of widely destroyed housing and

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[13] Personal communication, Dr. Oscar Rivera Rivera, USAID, Santo Domingo.

continued unstable weather. In the community survey, 56.6% of those who reported having been ill in the immediate post-disaster period said they had been living with other ill individuals. The community with the lowest percentage responding affirmatively to this question, Yaguate, also had the lowest percentage of its population in refugee shelters.

In terms of the need to prevent the transmission of water-borne diseases in the first two weeks, we can fairly say that within the resources available, the government and other aid agencies did all they could, but that little could be done. The government made a national appeal by radio to boil water before consuming it or using it to wash food. Population compliance was not good. In the community surveys an average of only 32.3% of the population reported having boiled their water, despite warnings from government and other sources. The storms made any pre-existing water filtration systems inoperable, and stand-by systems were not immediately available. Some aid organizations brought in water purification tablets, but it took weeks before they could be well distributed, and the quantity was inadequate. Civil Defense started delivering water in trucks to accessible areas, but many areas were inaccessible, and the delivered water was insufficient to meet all needs. Given the circumstances and the lack of cooperation by a projected two-thirds of the population, nothing more could have been done to prevent the spread of water-borne diseases.

To my knowledge, innoculation was not begun in the first two weeks after the hurricanes. Some typhoid vaccine was distributed and administered in the south-central portion of the country later, but no reports were available on how this two-part vaccine was actually

administered. Morever, the more acute need for the vaccine was probably actually in the far western portion of the country. (This could, of course, be interpreted much differently, i.e., the lack of a significant increase in typhoid fever in the south-central part of the country may have been because of vaccinating in that area. However, insufficient evidence exists of such a broad-based and well-coordinated vaccination program. If such an effective program had existed, surely someone among the many interviewed officials and residents in the study region would have remembered it.

Measles innoculation could have proven helpful if tied to close epidemiologic surveillance and a commitment to vaccinate where an increased measles case load was noted. It is possible, however, that the health ministry did not consider measles to be a possible cause of serious problems, because the ministry put faith in the expected effectiveness of the previous years' measles vaccination campaigns.

It is much easier to assess the relief efforts in terms of nutritional needs. Virtually all relief agencies recognized that the storms left large segments of the population without food or access to it. Stored food and crops in the fields had dissappeared with the winds and floods. Although made greatly difficult because of the extent of the need and the destruction of transport systems, food aid received immediate attention and high priority. Community respondents, as well as local leaders and disaster relief coordinators, praised the role of Civil Defense, USAID, CARE, CARITAS, Catholic Relief Services, and Church World Services in providing and distributing tremendous amounts of food. The population's health clearly would have suffered much more

had it not been for the combined efforts of the above organizations, along with others.[14]

In sum, at two weeks following the hurricanes, the trauma care had been minimally adequate in some areas and hampered in many others by a poor distribution of medical resources, poor emergency transport capability, and a policy of not allowing outside emergency care givers to converge on the country. Epidemiologic surveillance had been disjointed, and disease control was of secondary importance to trauma care and nutritional programs. It was often impossible to separate carriers of contagious diseases from the rest of the population, due to widespread destruction of housing and the community's lack of knowledge regarding simple sanitation measures. Water purification capacity was destroyed and a sample two-thirds of the population did not cooperate with the government effort to convince people to boil all water before consumption. Although emergency food relief programs had many logistical problems, they also met a tremendous amount of need on short notice.

Goodness of Fit at Six Months

During the six months following the hurricanes, as we have seen, the disaster-affected portion of the Dominican Republic experienced some major increases in infectious diseases. Colds and influenza, undefined

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[14] A recent report critical of international food aid listed the Dominican Republic's post-hurricane program as being a good example of how food relief can be timely, necessary, and with minimal negative side-effects. See: Jackson, Tony and Deborah Eade: Against the Grain: The Dilemma of Project Food Aid, Oxford, England: OXFAM, 1982.

fevers, gastro-intestinal diseases, and in some parts of the country, measles, hepatitis, and typhoid fever were experienced at epidemic levels. In the community survey an average of 26.4% of the populace reported illness in the immediate post-disaster period. If this is indicative of the experience of the entire disaster-affected portion of the country, the number of illnesses was not insignificant.

The proper response to the health problems of the first six months would have been prolonged epidemiologic surveillance closely tied to case investigation where increases were noted. This would have been immediately followed by the treatment of identified cases, and vaccination of the rest of the vulnerable population when appropriate. Environmental problems, such as contaminated water, should have received a high priority in the recovery-reconstruction phase of post-disaster activity.

What in fact happened is that the health care system quickly returned to "normal," which is sub-sufficient in the best of times. The data were collected and compiled as before, but apparently they were not being analyzed as they came in. Therefore, the health ministry did not react to the increases we have observed in gastroenteritis, measles, hepatitis, typhoid fever and other diseases. The special disease surveillance provided by outsiders immediately after the hurricanes was discontinued within four weeks of the disaster, before most of the major delayed-impact disease increases took place. At the field clinics the return to normalcy meant that medical students and recent graduates were available to diagnose and register the epidemics, but because of extreme lack of drugs and other basic supplies, they were powerless to

adequately treat the majority of the cases, much less stop the outbreaks.[15] The clinicians in the field did not know to look for a wave of delayed disease outbreaks, and the epidemiology staff in the health ministry provided no guidance.

Except to experienced epidemiologic observers, such as Dr. Amiro Perez Mera who was not in the health ministry at the time, the measles outbreaks probably came as a genuine surprise. The Dominican government had put some concerted effort in measles control during the previous few years. Many health officials apparently simply dismissed the possibility of major outbreaks following such large vaccination campaigns. Dr. Perez Mera and several others suggested, as previously mentioned, that the campaigns had been insufficiently effective due to a failure to maintain the vaccine at a suffiently cool temperature during the distribution and administration process. The fact that several of the rumored measles outbreaks in the first two weeks following the hurricanes turned out to be scabies may have further decreased incentive to check up on the increased reporting of measles several months arterwards. If so, the lack of incentive arose from a failure to remember that the new reports were coming from the clinics, not from frightened citizens.

In terms of water-borne diseases, the government probably took what preventive measures it could, short of requesting massive specific aid from abroad in the technology of post-disaster water purification. Maybe such a request should have been made. The government's resources

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[15] Personal communication, Dr. José Brea, practicing physician, rural San Cristóbal.

were so limited that it could do little more than work on restoring water supplies to the large population centers and carry out the previously mentioned radio campaign. There may be several reasons for the low population compliance with the directive to boil water: a lack of fuel with which to boil water; a feeling among the rural populace and the urban poor that they had already built up sufficient resistance to water-borne diseases; and a general lack of understanding among a largely illiterate population.

In sum, the public health response in the first six post-disaster months was not adequate to prevent or control major disease outbreaks. The outside disaster health teams left several weeks after the event and the country soon returned to its poor distribution of human and pharmaceutical health care resources, and the government failed to adequately address this problem. For whatever reasons, the epidemiologic data which came into the health ministry showing significant outbreaks in several diseases failed to provide the ministry with sufficient reason to mount a serious campaign to control the diseases. Because of insufficient resources, the installation of new water treatment capacity was long delayed, and the population cooperated poorly in treating its own water. The majority of the public health problems in the six months following the hurricanes were directly related to long-term structural problems that were exacerbated by the hurricane-changed environment.

Disaster Relief Evaluation: The Perception of Problems and Suggested Improvements

Both disaster relief recipients and providers were asked their

opinions of the problems encountered in the 1979 disaster relief process. Their suggestions for disaster relief improvement were also requested. The recipients queried include community leaders, health promoters, and community survey respondents. The health promoters are considered recipients because, although they may have been asked to help in providing first aid, they were at no time an integral part of planned aid. The relief providers that agreed to give evaluations and suggestions were from the Dominican Civil Defense, Dominican Red Cross, USAID, CARE, CARITAS, along with the Mennonite paster in Juan Barón and the director of the Medical Group Missions Program.

Community Leaders -- Problems

In discussing the aid problems, the community leaders did not focus on long-term community problems, such as the lack of medical personnel. Instead, they focussed on conditions that were caused by the hurricanes or were exacerbated by the storms. The problem area which was overwhelmingly emphasized was the condition of the shelters. There was almost unanimous agreement on the seriousness of the problem of poor sanitation in the shelters, augmented by a lack of latrines and overall shelter space. There was also general agreement that neither the community, in its own shelter management, nor the outside aid agencies were sufficiently quick in restoring or providing potable water to the sheltered population. Clean water was clearly seen as both a top priority and a general failing in the disaster response at every level.

The other major area of problems mentioned was the lack of cooperation. Although several community leaders mentioned inter-group

authority conflicts, there was considerable agreement among two of the three communities that the larger problem was a lack of cooperation on the part of the populace. The community of exception was Juan Barón. The other community leaders complained of poor public cooperation among the refugees in the shelters, a lack of help in taking care of basic needs, and a breakdown of normal social structure and authority lines. Some of this might have been a result of the "disaster shock" that sometimes sets in after a community incurs major losses. This syndrome is normally characterized by a temporary apparent paralysis of the individual. In Juan Baron, however, the community quickly reorganized itself after the hurricanes and started the recovery process with considerable vigor.

Community Leaders -- Suggestions

The interview question was, "What suggestions would you have for future health relief in communities like this, should another hurricane occur?" The overwhelming majority of the community leaders concentrated on preventive measures regarding long-term weaknesses. They almost unanimously responded that their communities needed some type of permanent medical personnel and supplies. (As it is, the clinics are permanent, but are usually only open when convenient to the rotating training programs of the medical schools.) Secondly, the community leaders recognized the need to have a cadre of local people trained in rescue and first aid, so that the community might be more self-sufficient in times of emergency. The other major long-term change often mentioned was the provision of more sturdy shelters and some kind of flood protection system.

In terms of disaster response organization, the community leaders had the following suggestions. The most common suggestion was that the medical personnel work closely with the community leaders in integrating the health response with other community recovery actions. Combined with this general suggestion were the more specific recommendations that each refugee shelter have its own health personnel available full-time. In cases of relatively predictable disasters, such as hurricanes, it was suggested that some emergency medical personnel be sent to the towns most likely to be affected before the onset of the disaster agent. This suggestion is consistent with the action taken by the Dominican Red Cross, as described above. The community leaders also suggested that their own communities should be involved in disaster contingency planning before the next disaster strikes.

Health Promoters

All of the health promoters interviewed were in their own communities at the time of the hurricanes. As previously stated, personnel at the local clinics asked about a third of the health promoters to help in the health relief effort and the rest did what they could on an individual basis. These people were both recipients and co-providers of aid following the hurricanes.

The health promoters were not asked directly to criticize the relief effort, but were asked to make suggestions about how to improve disaster response at the community level. The most general comments from the health promoters were "We need to be self-sufficient," and "We need plans in each community for response to a disaster." Specific

suggestions included providing more latrines in the shelters, better emergency water treatment, and relocating the poor away from the river banks. In conversations with the health promoters as a group after they completed the questionnaire, they strongly emphasized the need to be "self-sufficient" regarding medical and other types of emergency needs at the local level. While this suggestion may not be very helpful to the planners of health relief from outside of the community, it deserves serious attention in terms of an overall national plan for disaster preparedness.

Community Survey Respondents

The community survey respondents were asked two groups of questions. The first consisted of a list of disaster response institutions, about which the respondents were asked: "How do you think these institutions responded to the hurricanes?" The results are shown in Tables 6-1A and 6-1B. It should not be surprising that "doctors" were judged very highly. The highest judgement, however, came from the community of Juan Baron, which gave "foreigners" a 98.1% approval rating. The other communities did not recieve much attention from foreigners. What is more impressive, especially if the data are viewed on a community-by-community basis instead of being aggregated, is the degree of disagreement among the populace as to which organizations were active in their communities. For example, the Red Cross was not actively present in either Juan Barón or Palenque, yet more than half the respondents in those communities thought it had been. After discovering this phenomenon in the field, I specifically asked respondents which groups had been in the community after the hurricanes.

Table 6-1 A

HOW DO YOUR THINK THESE INSTITUTIONS RESPONDED TO THE HURRICANES? (1981)

Number/Percentage

Institution	Very good	Good	Indifferent	Poorly	Very poorly	Refuse to say	Did not come	No such thing
Government	4/ 2.3	84/47.7	15/8.5	29/16.5	15/8.5	8/4.5	19/10.8	2/1.1
Civil Defense (Capital)	3/ 1.8	61/37.0	9/5.5	18/10.9	4/2.4	12/7.3	51/30.0	7/4.2
Civil Defense (Local)	11/ 6.4	112/65.1	3/1.7	15/ 8.7	2/1.2	6/3.5	13/ 7.6	10/5.8
Local People	30/16.9	116/65.2	4/2.2	12/ 6.7	1/0.6	7/3.9	6/ 3.4	2/1.2
Doctors	45/25.6	116/65.9	1/0.6	1/ 0.6	0/ 0	5/2.8	7/ 4.0	1/0.6
Regional Administrator	13/ 7.2	95/52.5	18/9.9	23/12.7	6/3.3	9/5.0	13/ 7.2	4/2.2
1st Mayor (a)	7/13.0	41/75.9	1/1.9	2/ 3.7	0/ 0	2/3.7	0/ 0	1/1.9
2nd Mayor (a)	0/ 0	47/87.0	1/1.9	2/ 3.7	1/1.0	1/1.9	1/ 1.9	1/1.9
Police	7/ 3.9	125/69.1	8/4.4	16/ 8.8	2/1.1	8/4.4	14/ 7.7	1/0.6
Armed Forces	8/ 4.5	98/54.7	8/4.5	14/ 7.8	2/1.1	9/5.0	24/13.4	16/8.9
Churches	43/24.0	98/54.7	6/3.4	14/ 7.8	2/1.1	3/1.7	8/ 4.5	5/2.8
Teachers	7/ 4.0	99/56.3	12/6.8	19/10.8	5/2.8	9/5.1	9/ 5.1	16/9.1
Red Cross	7/ 3.9	83/45.8	4/2.2	17/ 9.4	3/1.7	8/4.4	55/30.4	4/2.2
SESPAS	17/ 9.7	127/72.6	2/1.1	8/ 4.6	1/0.6	6/3.4	13/ 7.4	1/0.6
CARE	14/ 8.0	113/64.6	7/4.0	10/ 5.7	4/2.3	6/3.4	15/ 8.6	5/2.9
CARITAS	8/ 5.3	79/52.7	11/7.3	10/ 6.7	3/2.0	9/6.0	21/14.0	9/6.0
Foreigners (b)	17/11.2	71/46.7	5/3.3	9/ 5.9	3/2.0	4/2.6	34/22.4	9/5.9

(a) Answers for Juan Baron only. Other towns have no mayor

(b) Answer for Juan Baron: Good or Very good = 53/54: 98.1%

Table 6-1 B
Approval Ratings: Good or Very Good on Table 6-1 A

Institution	Percentage
Doctors	91.5
1st Mayor (a)	88.9
2nd Mayor (a)	87.0
SESPAS	82.3
Local People	82.1
Churches	78.7
Police	73.0
CARE	72.6
Civil Defense (Local)	71.5
Teachers	60.3
Regional Administrator	59.7
Armed Forces	59.2
CARITAS	58.0
Foreigners	57.9
Government	50.0
Red Cross	49.7
Civil Defense (Capital)	38.8

(a) = Juan Baron only

About 70% admitted to not really knowing which ones had been there. Rather, they knew that several groups of outsiders had been active in their communities, but their identities were unclear. Only community leaders had a good recollection of which groups had been present. This

was probably because community leaders worked closely with the aid organizations.

Survey respondents were also asked if, considering the circumstances, the medical personnel had done everything possible to reestablish the communities' health conditions to their pre-disaster level. They were also asked what suggestions they would have for improving post-disaster health relief. Over 95% agreed that the health teams had done everything possible to restore health conditions. It should be mentioned here that literate, disease-healing medical personnel are held in very high esteem by rural Dominicans, and thus it is unlikely that any criticism would be leveled against them.

Of those who had an opinion about possible improvements, over 62% said that more medical supplies and personnel were needed. Many said that these should be permanently available. The other 35% of the comments were scattered, but most were directed at the need for community self-sufficiency in times of emergency.

Disaster Relief Providers

At least one top-level administrator in each organization was interviewed. Some of the questions they were asked to respond to are as follows: 1) Did the recent disaster relief proceed as planned? What problems were there? 2) What are the necessary requisites for achieving effective disaster relief, especially in the health field? 3) What are the negative characteristics in relief organizations that promote ineffectiveness in the relief process?, and 4) If you had the opportunity to do everything again, what would you change, and why? The responses are synopsized below, by organization.

Dominican Civil Defense

Civil Defense Director Pedro Justiniano Polanco stated that the relief following Hurricanes David and Frederick did not always follow previous plans. Faced with unforeseen complicated situations, improvisations had to be made. He believed, however, that these improvisations allowed the needs of the refugees to be fulfilled.

The necessary requisites mentioned for achieving effective disaster health care were adequate previous storage of the medicines needed for disaster relief, and the organization of previously trained medical brigades. The primary negative characteristic mentioned by Justiniano Polanco is the tendency of organizations and individuals to flock into disaster zones in large numbers without adequate training (the "convergence syndrome"). If he had to do it all again, he said, "In general, we would try to more effectively provide the services of communications, medical care, and shelter, for which we are now prepared. . . . (The new level of preparation presumably stems from having participated in several seminars and a disaster preparation symposium). Justiniano Polanco did not specify how he would improve the above named services.

U.S. Agency For International Development

The USAID interview was done with Mr. John Clary, assistant director of the mission in Santo Domingo and director in charge at the time of the hurricanes. From the U.S. embassy's point of view, the relief effort went as much according to "plan" as possible. Mr. Clary credited much of the responsibility for the well-run disaster relief to

having a "savvy ambassador" who directly involved himself in the U.S. relief effort. One reason the U.S. was able to respond so well to the immediate disaster needs was due to its large number of available resources, particularly the highly important helicopters. Another reason was the availability of the highly trained and disaster-experienced Disaster Area Survey Team. Mr. Clary listed the requisites for good disaster relief as being good plans, good communications, rapid all-weather, all-terrain transport, and experienced personnel. Clary did not respond directly to the issue of negative or unproductive characteristics of disaster groups. He did state, however, that if he were to do it all over again, the changes he would make would be 1) to have more people keeping records of what was done during the emergency period; 2) to have a better spread of radios throughout the country; and 3) to have a better petroleum stockpile so that emergency transport could continue regardless of damage to the normal fuel distribution system.

Dominican Red Cross

The spokesperson for the Dominican Red Cross was Lic. Demetrio Castillo, head of the Red Cross Disaster and Emergency Services. The disaster relief did not proceed entirely as the Red Cross had planned it. The extent of the disaster was much larger than anyone had imagined and the government was less prepared than the Red Cross had thought it would be. Particularly in the first few days after Hurricane David, the Red Cross was saddled with much more responsibility than it had expected. The reason for this, according to Castillo, was that the Red Cross was the only local organization that had a good supply of emergency material

and an ample organization of trained individuals. As a result of the unexpected extent to which other organizations depended on the Red Cross in the early emergency period, the organization at times seemed a bit overwhelmed, although it continued to function well.

In terms of requisites for effective disaster relief, Castillo said, "The aid has to be in place at the precise moment of need." This requires planning before the event by a team of directors who can respond to actual need at any time, and an organization that is trained and knows its roles. Castillo added that it is best to have first responders spread throughout the affected region, who know the region well. In regard to disfunctional characteristics in relief organizations, Castillo listed only two: duplication of functions and inter-agency competition for the attention of the press.

When asked what he would change if he were to do it again, the Red Cross Disaster Services Director said he would not change the system or organization of the Red Cross, but that a great deal of change was needed in the governmental system of emergency relief. To work toward this change, Castillo suggested the formation of a national council on emergency services, made up of all involved agencies, whose task it would be to draw up a national emergency response plan and to clarify roles of the individual agencies.

CARE

The person interviewed for the Dominican affiliate of CARE was Luis Martínez, assistant program director and emergency response coordinator. Martínez noted that CARE had no specific goals going into

the disaster relief process, so it was hard to tell whether things proceeded according to plan. He did note, however, that CARE's work in distributing food, an estimated 19 million pounds, would have been impossible without the transport and crowd-control help of the Dominican military. In Martínez' opinion, CARE's portion of the overall disaster relief operation went very well.

In response to the question about necessary characteristics for good disaster relief, Luis Martínez noted that good planning was essential. With good planning achieved well before the disaster event, the other two requisites mentioned by Martínez were also more likely to be fulfilled: 1) immediate response with a minimum of delays (only possible with good planning beforehand); and 2) a "mentality of rapid operation and cooperation," which ignores normal bureaucratic in-fighting and restrictions. Martínez listed disfunctional characteristics as being bureaucratic mentality, official indecision, and lack of coordination among major decision-makers. The changes CARE would make in the next disaster were two-fold. First, the organization would work more on self-initiative, yet keeping the government informed of its activities, rather than waiting for the government's bureaucratic wheels to gather momentum. Second, CARE would work on public relations with the disaster-affected communities, rather than worrying about relations with the general press.

CARITAS

The person interviewed for the Catholic charity and relief organization, CARITAS DOMINICANIS, was its Dominican executive director, Ramón Almont. The director felt that CARITAS functioned well in the

disaster relief period, but that it was somewhat restrained by the indecision and lack of direction from Civil Defense. Like CARE, CARITAS loaned nutritional experts to the Civil Defense in order to expedite decision-making and get the relief process started. Almont considered the rollowing characteristics as necessary for good disaster relief: 1) permanent organization of personnel experienced in relief procedures; 2) constant inventory of necessary resources protected from the disaster agent; 3) all-weather and all-terrain transport equipment; 4) a method of communicating with all organization members, regardless of circumstances; and 5) regarding health relief, the ability to respond quickly.

Ramón Almont considered the most disfunctional characteristic he had seen to be an organization's lack of knowledge of its own human and physical resources. Almont and others reported this to have been a problem with Civil Defense. The other major disfunctional characteristic mentioned by Almont was an agency's inability to communicate with all its members, due either to a lack of communications equipment or to the lack of a pre-planned communication protocol in emergency situations.

Under Almont's direction, CARITAS has already started to implement plans for different action in the event of another disaster. Almont feels that part of any aid and relief organization's normal budgeting process should be an emergency or disaster budget, which can help the agency attain close to normal budgeting order in disaster situations. He also felt strongly that every agency's disaster plan should state how the organization is to continue carrying out its normal

functions while also responding to the needs of the disaster situation. This plan should include the designation of an agency offical who can act as the coordinator between normal and disaster functions. Almont was also working on improving CARITAS' internal communications. Further, he nas been augmenting the agency's gasoline storage capacity.

The Mennonite pastor interviewed in Juan Baron listed the following as typical shortcomings in disaster relief groups: 1) They do not adequately define where they are going to work and what their role will be; 2) They enter a community and "do" without local participation, and then leave; and 3) They wait too long after the disaster occurrence to start working. The most important requisites, according to Mr. Baker, are good planning and clear role definition.

In sum, the agency in charge of the overall disaster relief coordination, Civil Defense, felt that things had gone well. The AID administrator agreed. Red Cross, CARE, and CARITAS personnel voiced the opinion that Civil Defense had been insufficiently prepared for the hurricanes and had acted slowly to the needs of the post-disaster relief period.

Almost everyone mentioned pre-disaster planning as the most important requisite for good disaster relief. Several specifically mentioned role clarification as being an integral component of such planning. The importance of such planning was particularly clear to those who felt that the leadership role of Civil Defense had been somehow lacking following Hurricanes David and Frederick. (Several of the interviewees privately suggested that if there had not been management assistance to Civil Defense from AID and other organizations,

considerably more confusion would have reigned).[16] Other requisites for good relief centered on quick response capability with experienced personnel and consistent supplies, all-weather and all-terrain transport capacity, a good communications network with pre-assigned roles, and exceptional bureaucratic cooperation. It is interesting to note that most of these characteristics are organizational, although supplies also play an obviously important role. In a country as supply-poor as the Dominican Republic, one might have expected stronger emphasis on material goods. For the most part, however, supplies can be quickly brought in from the outside, but little use can be made of them unless there is some kind of underlying organization to direct their application.

Many of the negative characteristics mentioned were also organizational in nature: duplication of function, lack of coordination, lack of inventory knowledge, lack of role definitions, poor decision-making, and poor management of communications. None of the mentioned negative characteristics was directly related to insufficient supplies. One was related to uncontrolled outside forces

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[16] A recent publication by Thomas Drabek et al provides a good sociological examination of the difficulties in managing a multiorganizational response to a disaster or emergency situation. Considering the Civil Defense's serious lack of resources and the difficulty of dealing with a variety of organizations that have different authority patterns and role expectations, as discussed in Drabek's work, the performance of the Dominican Civil Defense can be seen in a much more positive light. Still, there remains considerable room for making improvements based on what was learned from the response to Hurricanes David and Frederick. See: Drabek, Thomas E., Harriet L. Tamminga, Thomas S. Kilijanek, Christopher R. Adams: Managing Multiorganizational Emergency Responses: Emergent Search and Rescue Networks in Natural Disaster and Remote Area Settings, Boulder, Colorado: University of Colorado Institute of Behavioral Science, 1981.

(the convergence phenomenon), and two were related to perceived inappropriate actions on the part of the relief organization -- too much press competition and leaving affected areas too early. The perception that relief organizations left too early ties in well with our findings that major disease increases may occur from a month to six months after the disaster onset.

With the exception of one organization, the things these administrators said they would do, or are doing differently in anticipation of the next disaster were all aimed at making their organizations more versatile and self-sufficient in disaster conditions. They want better petroleum stockpiles, better communications equipment and protocol, better role clarification and budget versatility, and a more independent orientation. The exception was the Red Cross, which had a more global orientation. Its disaster administrator called for the formation of a national council to plan for emergency contingencies and to co-administer with the Civil Defense during the next actual disaster.

We have looked at two of the three major variables in this case study: the disaster-caused public health impact (needs), and the organized disaster relief and health services that attempted to address the population's post-disaster needs. The next chapter is an examination of the third major variable, the population's response to the disaster. It is often the response of the population that determines which public health problems will be exacerbated and whether relief programs proceed smoothly or stumble without positive effect.