

The Health Sector Response

The principal role of the health sector during an emergency is to implement the plan of the Medical and Relief Measures Committee of the NEMO. The Committee is comprised of the following:

- Permanent Secretary, Ministry of Health, Chairperson
- Representative, Director of Health Services
- Director of Environmental Health
- Hospital Administrator
- Principal Nursing Officer
- Representative, Belize Red Cross
- Representative, PAHO/WHO
- Representative, Veterinary Office
- Representative, Belize Medical and Dental Association

The terms of reference of the Committee are:

- (1) To have in place a plan for the effective distribution of medical supplies whenever needed,
- (2) To ensure that an adequate supply of emergency medical supplies are available,
- (3) To make provision for the establishment of emergency hospital units at designated areas,
- (4) To ensure that adequate resources are available for the transportation of those in need of immediate medical attention,
- (5) To identify an effective method for dispatching medical teams to accident or disaster sites,
- (6) To make adequate provision for the disposal of the dead, and
- (7) **To develop a program that would prevent the outbreak of diseases that are related to disaster conditions.**

The health sector is also represented on other committees of the NEMO. The Senior Public Health Inspector is a member of the Search, Rescue and Initial Clearance Committee. The Belize Red Cross Society is on the Collection, Control and Distribution of Food and Materials Committee and the Foreign Assistance Committee.

A Senior Medical Officer and a representative of the Red Cross are members of the District and Municipal Emergency Committees.

The Disaster Management Plan requires that the Medical Committee be activated during the Response and Recovery Stages of the Hurricane Plan. Obviously, if the Committee is to act during these stages, it must take preparatory measures during the Alert Stage. This is not evident in the Plan, which does not list any duties for the Committee during Phase I when preparations are needed.

In the event of a medical emergency such as an epidemic, the Director of Health Services triggers the Alert Stage of the Emergency Plan. Similarly, in the event of a major road accident, the Head of the Accident and Emergency Unit would implement the Alert Stage.

At the district level, the plan does involve the health sector at the inception of the Hurricane Emergency Plan. At Phase I, District Medical Officers are required to set up Emergency Hospitals, inspect first aid supplies and assign those supplies and personnel to Hurricane Shelters. The Public Health Inspectors should secure water supplies and other essential supplies such as lanterns and flashlights for the Hurricane Shelters.

At Phase II, medical personnel and the Red Cross should staff all shelters. Hospital patients should be discharged to the care of their families. Critical cases should be transported to the Emergency Hospitals.

At the Green Phase, the primary responsibility of the Health Committee is to act to prevent an outbreak of disease. The Medical Department and the Red Cross are also required to provide resources to the Search and Rescue Committee.

The Mitch Experience

The Permanent Secretary, Ministry of Health attended the first meeting of NEMO at 5:00pm on Sunday. The purpose of that meeting was to assess the state of preparedness of the Operational Committees.

Although Phase I was declared Sunday afternoon, the Medical and Relief Measures Committee did not convene its first meeting until Monday at 2:00pm. Many senior health officials were in Chetumal attending a meeting with their Mexican counterparts to open the border Health Week. An earlier meeting would have been pointless with so many of the key players absent. When the meeting was held, there was no representation from the Belize Red Cross, PAHO/WHO, the Veterinary Office, or the Belize Medical and Dental Association. PAHO/WHO and the Red Cross were already implementing their hurricane preparedness plans, securing their buildings and equipment, providing for their staff and preparing to evacuate.

The Ministry of Health has a well-developed hurricane plan. It required the establishment of two Emergency Hospitals in Belize City, one on the north side and the other on the south side. These would provide health care to all residents and would mitigate against damage to the bridges which could cause one side or the other to be inaccessible. Upon inspection, however, both sites were totally inadequate.

It became obvious that the medical facilities in Belize City would not have withstood the direct impact of hurricane Mitch. No locations capable of withstanding a Category 5 hurricane had been identified. As a result, all facilities in Belize City were evacuated to Belmopan and Orange Walk. The hospital at Airport Camp was identified as

the center, which would provide service to Belize City. Yet there was no provision for transporting medical personnel or supplies to the Airport Camp to staff the facility.

The Psychiatric Hospital at Rockville was also evacuated because of the threat of flooding from the nearby Sibun River. Facilities in Belmopan were overburdened. The hospital was in no condition to deal with the additional patients and the demand of an expanded population. That health personnel were able to deliver services in those conditions is a testament to their commitment.

The health plan did not consider the total evacuation of Belize City. This affected the deployment of staff to the various hurricane shelters as stipulated by the national hurricane plan. Although the NEMO recommended evacuation in Belize City, 16 official shelters were opened which housed over 4,000 persons. Medical personnel then had to be deployed into an evacuated zone. This is obviously a discrepancy in the implementation of the hurricane plan which sends conflicting signals and creates problems in the decision making process.

The magnitude of the hurricane produced more evacuees than had been contemplated in the plan. These numbers exceeded the capacity of the existing shelters. As a result, there was a need to identify additional shelters. Some shelters were also occupied before they were officially opened. These two factors resulted in some shelters being without medical personnel for the first 12 hours. Thereafter, all shelters would be properly staffed. This was fortunate because the medical personnel could see the conditions of the shelters. They were overcrowded and lacked proper sanitary facilities. They were then in position to alert senior health officials of the implications and early remedial action taken. Unfortunately, no organized or systematic epidemiological surveillance system was in place to properly document the health problems.

Medical supplies were in short supply. The Ministry of Health Disaster Plan stipulates that emergency medical supplies should be pre-packaged and ready for immediate release at the start of the hurricane season. Budgetary constraints had precluded the implementation of this plan. As a result, there was a shortage of medical supplies in the shelters. Fortunately, the BDF was able to provide some assistance. However, this depleted their sparse resources. If they had had to respond to an emergency in some part of the country, they would have had no medical supplies for that community since it had been used in the early part of the disaster.

The Rio Hondo Agricultural Rehabilitation Project provided emergency supplies to the Orange Walk Hurricane Committee. PAHO/WHO and the Belize Red Cross also provided medical supplies through the NEMO.

The Medical Committee did inform the Foreign Assistance Committee of their needs and provided them with a detailed list of the supplies required. Unfortunately, the list was not properly ordered and it had to be reformatted to meet the requirements of the responding agencies. Although health officials had received training in the SUMA

methodology and had the hardware and software to implement the program, this was not done. Apparently, all equipment had been stored and was inaccessible. By Wednesday, an official request from Belize had gone out to donor agencies.

The medical teams also lacked proper communication equipment. The personnel in the shelters did not have any. There were five ambulances ready to service shelters in Belize City and Belmopan. However, the drivers did not have access to communication equipment either. As a result, this valuable resource was unavailable.

Fortunately, there were no major medical emergencies, and the health sector was able to respond adequately to all incidents that occurred. There were no fatalities except for the death of an infirm elderly lady who died as she was about to be evacuated from Belize City to Belmopan.

At the declaration of the Green Phase, the Medical and Relief Measures Committee implemented its plan to prevent the outbreak of diseases. The weakness in the composition of the committee became obvious, as it did not include an epidemiologist.

The overcrowded and unsanitary conditions, which prevailed for five days, produced an increase in infectious diseases. These included diarrheal diseases, upper respiratory infections and conjunctivitis. If a proper epidemiologic surveillance had been in place, it would have improved the health response at the conclusion of the emergency.

Heavy rainfall and high tides resulted in flooding of low lying and coastal areas. This caused sewage systems and septic tanks to overflow, which contaminated wells, a major source of water on the cayes and in rural areas. Large sectors of the population were thus at risk of experiencing outbreaks of water borne diseases such as cholera, hepatitis and vector borne diseases such as malaria and dengue. Five cases of cholera were reported among the refugee population living on the outskirts of Belmopan.

San Pedro, Caye Caulker and Belize City were especially affected by flooding from the sea. Communities in central Belize where drainage was poor experienced significant flooding from rainfall. (See Figure 6).

The Crooked Tree community was especially affected by the flooding. Some homes were totally surrounded by water. The access road was impassable and boats had to be used to reach the community. The proximity of the lagoon and extremely slow drainage made this a long-term sustained flooding problem. The threat of water borne diseases in the area required continuous monitoring.

Countrywide, health authorities had already noted the presence of antibodies for dengue type 1, 2 and 3 in different population groups. These individuals were thus at risk of developing dengue hemorrhagic fever. They also noted that the recent outbreak of *Falciparum* malaria in the Cayo District would be exacerbated as a result of an increased *Anopheles* mosquito population caused by heavy rainfall.

The authorities also noted that the impact of Mitch on our neighbors could trigger a tide of environmental and economic refugees into Belize. They would create a stress on an already weak sanitary infrastructure.

A request for assistance to meet these challenges was submitted. It included medical supplies, strengthened outreach services, a vector control program, water testing and treatment equipment, a public awareness campaign, consultancy to assess damage to facilities and vulnerability to future disaster threats, and emergency outreach programs targeted at refugees. The total cost of implementing these programs was estimated at US\$165,600.

The Ministry of Health also convened a committee together with the Ministry of Public Utilities and the Department of the Environment to assess the nation's water supply. A plan of action was recommended and implemented to test the water supply and implement a water treatment program to head off any threat to the supply. This was especially crucial with the onset of the tourist season.

PAHO/WHO provided US\$17,000 to assist the Ministry of Health in implementing its water and sanitation program, US\$20,000 for medicine and supplies and US\$50,000 for water and sanitation vector control.

At the request of the Ministry of Health, PAHO/WHO arranged for a technical team comprising a sanitary engineer from the Caribbean Disaster Program and an epidemiologist and a vector control specialist from CAREC to conduct a thorough epidemiological assessment and develop a plan of action.

The team met with key health officials and inspected areas of the country identified as vulnerable or at high risk. These included Ambergris Caye, Belmopan and the Cayo, Stann Creek, Belize and Orange Walk Districts. On the field visits the team tested the water supplies and other bodies of water. The potential for vector borne was noted. The environmental conditions observed were also conducive for the transmission of diseases. The team also concluded that the impact of Mitch on neighboring countries and the large migrant farming community favored the influx of many refugees into the country.

The team congratulated the health authorities for the actions it had taken in coping with the emergency, handling a massive evacuation, shelter and feeding exercise and preventing the outbreak of a medical emergency. However, it noted with concern the slow response at the central level of the Ministry of Health to implement the response and a weakness in coordination with other sectors of NEMO.

The team made several recommendations to improve the health sector's disaster response. These were short term or immediate recommendations to deal with present conditions, and medium term recommendations to be implemented before the onset of the 1999 hurricane season.

Similarly, recommendations were made for epidemiologic surveillance. Short term and medium to long term recommendations were made for vector control, and environmental health and sanitation. These recommendations were provided to the Ministry of Health, which used them in preparing its requests for assistance.

During Tradewinds 98, PAHO/WHO had assisted in the training component conducted early in the exercise cycle. These included four weeklong workshops in shelter management, water and sanitation, mass casualty, and the SUMA methodology. Some of the expertise was implemented during Mitch. However, much more needs to be disseminated to implementing personnel and the use of SUMA encouraged. A suitable site with proper facilities must be identified to install the equipment to ensure timely deployment of supplies.

There is also a need for senior health officials to be at the NEMO Headquarters and Emergency Control Center to coordinate response measures. That information must then be disseminated quickly to health authorities in the field. The visibility of the health sector in NEMO should be enhanced to include them in the Alert Stage. One step toward this objective may be in renaming the committee, the Health Disaster Committee.

Was Belize Prepared?

Belize is a member of the Caribbean Disaster Emergency Response Agency (CDERA). In March and April 1998, Belize hosted Tradewinds 98, an exercise conducted by CDERA each year to train disaster management personnel in its member states and to test the emergency response plans of the host country.

The Disaster Exercise was a series of live events. A hurricane was simulated to affect the country. Several of the live events practiced became a reality during Mitch. An evacuation exercise was conducted for San Pedro; San Ignacio was evacuated because of flooding; a search and rescue exercise conducted was off Caye Cauer; and a fire broke out during the hurricane threat.

Although there were a few problems encountered during the exercise, it went fairly well. However, the response agencies knew about the exercise and were prepared for it. In some instances, equipment and personnel were re-deployed near the disaster sites. An official evaluation from CDERA would be useful.

However, the actual members of NEMO and the Operations Centre did not play out the exercise for the entire period as called for by the Tradewinds 98 plan. This was delegated to subordinate officials. This highlights the weakness of the Belize Emergency Plan.

There is no full-time Office of Disaster Preparedness, Emergency Coordinator, or staff dedicated to this effort. These duties are given to officers as additional duties of their posts. There are scores of persons trained in all aspects of disaster management in the country and especially in the government service. This training is usually undertaken as part of the person's posting. However, that person is frequently reassigned to other functions and his/her disaster training not utilized in the new posting.

Permanent Secretaries (PS's) are the chairpersons of the Operational Committees. These PS's may be reassigned to other ministries at a moment's notice. Unfortunately, the chair of the committees is not assigned by the expertise of the PS but by his/her posting.

The chairpersons of the District Emergency Committees are selected by the Prime Minister. This function is not a priority of the Prime Minister and unless the Cabinet Secretary places it on his agenda, it may be forgotten.

Mayors and mayoresses of municipalities are the Chairpersons of the municipal Emergency Committees. If they are members of the opposition, they may not get the immediate respect or support of the agencies responsible for responding to the emergency. The agency may wait to get direct orders from NEMO or its parent ministry.

The Belize Emergency Preparedness Plan lists the members and terms of reference of the Operational Committee. However, it does not contain the plans of these committees. Some of these committees may not even have written plans! Therefore, a PS assuming the chair of a new committee may not have proper documentation for guidance. One serious flaw in the plan is that there is no Hurricane Committee, a group of key officials to deal with all aspects of response to the threat. The Acting Chief Meteorologist was never present at subsequent meetings of NEMO after the initial briefing exercise. In the past, he has been at the Cabinet Secretary's right hand, assisting in the preparation of Bulletins and Press Releases and providing advice to all the committees in the various stages of response.

Many committees had not implemented their hurricane preparedness exercises such as checking shelters, assigning tasks to officers, compiling inventories, testing equipment, etc. There were no evacuation plans. The transport committee did not have an inventory of vehicles available to NEMO. The shelters were in a state of disrepair. The list of shelters had not been updated nor their capacities calculated. There was no estimate of the number of persons who would require emergency shelter. Emergency medical supplies were insufficient and were not prepared for rapid distribution.

The Belize Hurricane Preparedness Plan is based on the country's past experiences. The country has usually gone through a two-day preparatory stage with limited evacuation. Residents have gone into shelters for about a day or two and then emerged to commence recovery operations. Belize has never faced a hurricane of this strength. It has never undertaken an evacuation of this magnitude. Its citizens have not been housed in shelters for this long. The government has never had to undertake a feeding program during the response stage. This has occurred in the recovery stage.

NEMO was comprised of a government that had taken office less than two months before. PS's had just been reassigned and were just becoming familiar with their ministries. Disaster preparedness may have been a secondary concern especially at the end of the hurricane season.

As a coordination mechanism, NEMO was not prepared to deal with the emergency. However, many of the implementing agencies were well prepared. As a result, problems occurred in initiating responses. Once the proper agencies or persons were identified, the mechanism functioned and the tasks completed. There were simply too many of these start-up problems. Coordination among agencies and persons was lacking.

Yet in spite of these shortcomings, the country executed an efficient evacuation exercise that had not been envisioned or planned. If the hurricane had hit the country, many lives would have been saved. It is unfortunate that many of the shelters to which people had fled were not adequate and would have been damaged from hurricane force winds resulting in loss of life.

At the local level, the District and Municipal Emergency Committees functioned effectively. The evacuation of San Pedro was initiated at the local level pre-empting the NEMO. This would have saved lives because time would have been wasted if they had waited. The evacuation was implemented primarily at the local level with only a little assistance from NEMO.

Reports from Corozal, Orange Walk and San Ignacio indicate that officials there acted promptly and efficiently often without sufficient guidelines being provided by NEMO headquarters. This was primarily due to poor communication. Yet officials were able to implement their hurricane preparations in a timely fashion even when elements of their plan failed because some officers failed to fulfill their obligations.

The Government Post Mitch Assessment

The government acknowledged it had a problem as it tried to execute the Disaster Plan. As soon as the exercise was over, it requested its ministries and other agencies for suggestions to improve the plan. The Senior Minister was assigned the responsibility for improving the plan. A former Cabinet Secretary was assigned as his Executive Assistant. Many recommendations have poured in, and a Cabinet Paper was submitted with recommendations for improvements.

Consultants have been contracted to assess all buildings to be used during emergencies and provide estimates for their rehabilitation where necessary.

Funding has been received for building new hurricane shelters. These will be multi-purpose buildings. Five will be constructed in Belmopan, and one each in Orange Walk, Dangriga and Punta Gorda.

Government is negotiating a loan with the CDB for the expansion of the water and sewage system for a larger Belmopan and to accommodate 20,000 additional persons in times of emergency.

Cabinet has agreed to name a full-time Disaster Coordinator at the level of Permanent Secretary. The government has secured a loan from the Caribbean Development Bank (CDB) to contract the services of CDERA to provide consultancy services for the institutional strengthening of NEMO.

The government had recently received funding to implement its housing program. A scheme to create satellite villages around Belize City figured prominently in the program. Hurricane Mitch demonstrated the vulnerability of these sites. A committee is reevaluating these sites and alternate sites in safer locations are being proposed. These include areas near Orange Walk Town, Belmopan and La Democracia.

Conclusion

Belize lies in the hurricane belt. Hurricane activity exhibits a cyclical variability. The 1950's through to the early 70's were active in our region. Belize responded to threats frequently and as a result updated and implemented its Hurricane Plan regularly.

The late 70's, 80's and 90's were generally quiet. Inactivity has led to some complacency. The growth along the vulnerable coastal zone has not been accompanied by adjustments in the hurricane plan. Meteorologists believe that western Caribbean including Belize is once again entering an active period. It is therefore important that Belize be prepared to deal with these threats.

Belize was fortunate to have been spared the wrath of Mitch. The threat and response should be used as an exercise and as a worse case scenario upon which to create an effective Hurricane Plan.

After the 1961 hurricane Hattie disaster, Belize has implemented an effective hurricane emergency plan. It worked well during hurricanes Carmen and Fifi in 1974 and hurricane Greta in 1978. Although these three hurricanes made landfall in Belize, only two lives were lost. An effective warning system properly executed prevents loss of life

Belize is fortunate to have considerable landmass and natural resources with which to implement a proper hurricane mitigation program.

Recommendations

- It is essential that a full-time Office of Disaster Preparedness be created and a Disaster Coordinator be named. This post must be at a level that will command the respect and response of all agencies in the country. The post must be filled by someone who is respected by the agencies tasked with responding to emergencies. Yet, the individual must be personable so that he can interact with the media and the general public.
- The Disaster Management Plan must include the plans of all the implementing agencies, operational committees, district and municipal committees. Persons trained in disaster management must lead these committees.
- A list of persons with emergency preparedness and management expertise should be compiled. During the past fifteen years, many persons in the public and private sectors have received training in various aspects of disaster management and response and have participated in disaster exercises in the Caribbean and Central America. Many professionals in the Public Service have received training in disaster preparedness as part of their formal training. These persons must be included in the Emergency Plan and placed where their training will be utilized regardless of their present posting.
- There are many agencies in Belize, which are active in public awareness activities in disaster preparedness. Their efforts should be harnessed to create a strong and effective public education campaign in emergency preparedness at the household level. This will alleviate the burden on government's resources.
- An evacuation plan must be created indicating how many people will require evacuation, staging areas, evacuation routes and an inventory of vehicles available for the exercise. The carrying capacity of the roads must be calculated to determine the lead-time necessary to begin evacuation. Traffic officers should be deployed to ensure the smooth flow of traffic.
- A building with all emergency facilities must be identified as the national Emergency Response Centre. It must have communication facilities and an emergency power and water supply. It should have conference facilities along with an area available for press briefings. The building should be self-contained with eating and sleeping facilities. This building should be located in Belmopan.
- The Government of Belize must promote the development and growth of Belmopan and discourage development of vulnerable areas and reclamation in Belize City. The capital was created in response to the destruction of Belize City by hurricanes on two occasions, the 1931 hurricane and Hurricane Hattie (1961) and the realization that in the future other hurricanes were sure to strike

the country. Yet the response of the public and even the government to move has been slow. It was estimated that Belmopan would have had a population approaching 35,000 by the year 2000. Yet the population is barely 7,000.

- Development on the seaward side of sand dunes should be prohibited. All construction should be done behind these dunes. The clearing of mangroves for development should be discouraged. The mangroves and the beaches are in the dynamic coastal zone. They are the buffer zones between land and sea and will always be subject to occasional flooding. They are able to withstand hurricanes and other severe weather if left undisturbed. They depend on hurricanes for health and regeneration. These areas are also the most vulnerable to the adverse effects of climate change and sea level rise.
- Besides Belmopan, there are several other communities that should be considered as good sites for refuge from hurricanes. These include Orange Walk Town, San Ignacio/Santa Elena and Benque Viejo. These towns are all sufficiently far inland that they would not be subjected to the storm surge (high tide) associated with hurricanes. The force of the wind would have been reduced by friction by the time the hurricane reached these areas. Hill top sites would be vulnerable to strong winds. Buildings erected on exposed hills there should be capable of withstanding stronger winds. Valleys sometimes create a funneling effect, which also cause winds to accelerate. However, all these towns are near rivers. Therefore, it is important that flood plain maps be generated for these areas so that the risks can be assessed. Development in the flood plain should be limited to activities that are seasonal and structures erected that would not be damaged by floods or not very expensive to replace. Finally, the infrastructure must be evaluated to calculate the carrying capacity of each municipality. This should include water, waste, electricity and communication systems.
- Flood plain mapping should be done for all communities near rivers. If communities are deemed to be too vulnerable to flooding, then they should be relocated.
- Executive disaster training should be provided to all Permanent Secretaries and other senior government officials who are required to provide support in disaster preparedness or implement disaster plans. These can be provided in short, intensive one or two day sessions for which international assistance is available.
- The role of the health sector in NEMO should be enhanced. A health representative should be stationed in the Emergency Center to coordinate with the other committees. To stress the importance of health, the name of the committee should be changed to the Health Disaster Committee.

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