DISASTERS

PREPAREDNESS AND MITIGATION IN THE AMERICAS

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INSIDE

SUMA: A Versatile Tool for Management and Good Governance

Just as the terms "coordination" and "exchange of information" were popular in the past, the new buzzwords in the humanitarian and development lexicon are "accountability" and "transparency."

The days when governments and agencies jealously guarded their books and files from public scrutiny has become unsustainable and just plain unpopular with the international community. Humanitarian operations are no exception to this trend. Indeed, the misuse of donations after the 1972 earthquake in Nicaragua is still deeply etched in the collective public memory. Today, secrecy and "control" of information inevitably lead to suspicions of abuse of power.

Donors, and to a growing degree the public in affected countries, are losing confidence in the honesty and efficiency of the official response to disasters (both by governments and organizations), and in the way that resources are managed. One consequence of this loss of confidence is the marked shift toward channeling assistance and resources to non-governmental organizations (NGOs) or through civil society at large—an alternative that is not devoid of its own problems and shortcomings.

(cont. on pg. 7)

Both disaster-stricken countries, recipients of aid, and donor countries and agencies that provide relief, are calling for greater transparency and accountability in humanitarian operations.

Photo:A. Waak, PAHO/WHO

Hundreds Meet to Evaluate Georges and Mitch

An evaluation of how stricken countries prepared for and responded to Hurricanes Georges and Mitch was the topic of a major multi-agency meeting held in the Dominican Republic from 16-19 February. At the meeting, 400 disaster professionals from 48 countries used the opportunity to identify lessons learned from these devastating hurricanes. Participants formulated recommendations for improving preparedness and response in future events during 20 working groups on topics that ranged from the impact on the environment to the transition from emergency to reconstruction; from drinking water and sanitation to communicable diseases.

A list of topics from the working groups, as well as the summary conclusions of both the health and non-health groups is on the meeting web site at http://www.paho.org/english/ped/pedeval.htm. This site also houses draft national reports by countries affected by the hurricanes (which can be downloaded). A publication compiling these reports is being prepared. For more information write disaster-meeting@paho.org. ❑

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News from PAHO/WHO

New Coordinator for WHO Collaborating Center

The University of Antioquia in Medellin, Colombia is the WHO Collaborating Center on Emergency and Disaster Preparedness. As of January 1999, the Center's new director is Prof. Ivan Dario Rendon Ospina. The Collaborating Center advises the health faculties of the region's universities on organizing a disaster component within their curriculum.

Visit their web site at www4.salud.org.ec/desastre/centros.htm.

An Organization-wide Effort Addresses the Health Impact of Disasters

In 1998, nature struck with a vengeance. Hurricane Georges was the first, leaving a trail of destruction in the eastern Caribbean and the Gulf of Mexico in September. Hurricane Mitch followed, a rare, catastrophic category V storm, triggering deadly mudslides and flooding in Honduras, Nicaragua, El Salvador, and Guatemala. More recently in the news, the earthquake that struck Colombia left more than 500 dead and thousands homeless.

In these cases, PAHO/WHO mobilized a strong field presence of public health experts to respond to the health effects of the disasters. The information below on Hurricane Mitch was excerpted from **PAHO Today,** *the newsletter of the Pan American Health Organization.*

Hurricane Mitch

During the first 48 hours, as the full impact of Mitch's havoc emerged, PAHO conducted a rapid assessment of damages and emergency health needs. A 24-hour situation room was set up at Headquarters in Washington to coordinate emergency response to Mitch. A team of more than 200 local and PAHO health and disaster experts identified as top priorities the provision of safe water and adequate sanitation, close epidemiological surveillance to head off possible disease outbreaks, and reestablishing health service networks.

One of PAHO/WHO's strengths is its ability to mobilize technical expertise in a wide variety of public health fields from among its 35 Member Countries.
Photo:PAHO/WHO, C. Osorio

As the needs for medicines, insecticides, water purification materials, waste disposal systems, and hospital equipment became critical, the deluge of international donations posed serious logistic and management problems for national authorities. The SUMA system allowed relief workers to quickly sort out life-saving items from nonessential goods and track these materials from point of entry to key storage and distribution sites.

In Washington, PAHO staff monitored the international health response and produced comprehensive daily situation updates which were available online on the Mitch web site http://www.paho.org/english/ped/pedmitch.htm.

The ability to prepare timely reports came as a result of a major Internet drive begun by PAHO in 1995. Hurricanes Georges and Mitch were the first Internet-intensive disasters, and the Internet proved to be an efficient tool for the rapid exchange of information among health and disaster personnel in the Americas.

Hurricane Mitch shattered as much as 70 percent of Honduras' and Nicaragua's basic infrastructure, setting back socioeconomic development 50 years. Diseases such as cholera, malaria, dengue fever, and leptospirosis, present in Central America before the hurricane, made the risk of outbreaks all the more serious.

In an effort to reach out and help communities struck hardest by Mitch, PAHO prepared a series of 30-second public service announcements for radio and television showing people how to avoid disease and stay healthy during the emergency. Topics dealt with included water and sanitation, safe food handling, and mosquito control. PAHO also hosted a series of special radio programs focusing on the psychological impact disasters can have, particularly on children.

Just as health authorities in all countries began taking stricter control measures to improve food safety and guarantee the quality of water for human consumption, doctors and epidemiologists became more vigilant in looking for people who became sick and treating them to ensure that out-

(cont. on pg. 7)

Other Organizations

Research Publications Available Electronically from NAP

The information age has advanced to a new level for hazard researchers with the creation of the National Academy Press (NAP) Reading Room on the World Wide Web. At that site, http://www.nap.edu/readingroom/, NAP documents, reports, and books may be viewed, printed or ordered on-line.

Recent titles include:"Reducing Disaster Losses Through Better Information" (1998, 60 pp); "Review of Recommendations for Probabilistic Seismic Hazard Analysis: Guidance on Uncertainty and Use of Experts" (1997, 85 pp); "Earthquake Prediction: The Scientific Challenge" (1996, 128 pp.); "Report of the Observer Panel for the U.S.-Japan Earthquake Policy Symposium" (1998, 72 pp.); and "Cooperating With Nature: Confronting Natural Hazards with Land-Use Planning for Sustainable Communities" (1998, 368 pp.).

For more information, contact the National Academy Press, fax: (202) 334-2451 or e-mail the Customer Service staff at amerchan@nas.edu. ❑

Advanced Degrees in Disaster Management and Policy

GWU Offers New Graduate-Level Disaster Courses

The George Washington University's Department of Engineering Management, supported by the GWU Institute for Crisis, Disaster, and Risk Management, is offering the degrees of Master of Science and Master of Engineering Management with a concentration in Crisis and Emergency Management. This 36-credit-hour program is designed to provide interdisciplinary graduate education for persons engaged in or seeking professional careers in crisis, disaster, and emergency management.

A Certificate Program will also be offered this spring in addition to the degree programs. For more information, please visit: http://www.seas.gwu.edu/seas/emgt; phone: (703) 729-8271; e-mail: crisismgt@seas.gwu.edu. ❑

University of Delaware

Last August, the University of Delaware initiated a new interdisciplinary, inter-college M.A. and Ph.D. program in Environmental and Energy Policy. Among its five major concentrations is one on disaster policy supported by staff of the Disaster Research Center at the University. The concentration curriculum will include FEMA Higher Education Project emergency management courses. For additional information, contact the Center for Energy and Environmental Policy, fax: (302)831-3098; e-mail: patricia.grimes@mvs.udel.edu. ❑

Final Stretch for the IDNDR

As the International Decade for Natural Disaster Reduction draws to a close, what has been achieved and what still needs to be done to reduce the impact of disasters in the Americas? What have we learned throughout the 1990s? What patterns will future disasters follow?

These are the themes of the *Hemispheric Meeting of the IDNDR for the Americas: Toward a Reduction in the Impact of Disasters for the 21st Century*. This meeting, scheduled from May 31- June 5, 1999 in San José, Costa Rica, forms part of the global closing ceremonies for the IDNDR.

The meeting is being organized by the Government of Costa Rica's National Emergency Commission, the Ministry of Foreign Affairs, the IDNDR Secretariat and PAHO.

Co-sponsoring agencies (the International Federation of Red Cross and Red Crescent Societies, the OAS, CDERA, CEPREDENAC, OFDA/USAID, and the World Meteorological Organization) will organize parallel sessions and workshops on: Disaster Prevention and Sustainable Development; Information and Technology Transfer; Risk Assessment; and Public/Private Partnerships for Disaster Prevention.

Organizations, agencies and institutions are invited to become cosponsors of this meeting by organizing and financing a session or parallel meeting on a related topic.

This process of reviewing and defining a strategy for disaster reduction into the 21st century will culminate in the Global Forum of the IDNDR, to be held later this year in Geneva.

The Organizing Committee is calling for country and sectoral reports on progress and pending challenges for disaster reduction. Send abstracts or proposals for presentations showing specific progress, before April 15, to the Organizing Committee, email: hmolin@undpcos.nu.or.cr; fax: (506) 257-2139 or visit www.disaster.info.desastres.net/idndr. ❑

Member Countries

PAHO's Central American Disaster Office Strengthened

Dr. Rocio Saenz has joined the PAHO/WHO staff as a disaster preparedness officer for Central America. Dr. Saenz can be reached at phone: (506) 257-2141; fax (506) 257-2139; e-mail: rsaen@netsalud.sa.cr.
To contact PAHO's disaster advisers throughout the Americas see our web site: http://www.paho.org/english/ped/pedhome.htm (click on *How to Contact Us*) or consult the previous issue of this newsletter.

Central American Presidents Meet to Discuss Mitch

On 9 November, Central American presidents met in Comalapa, El Salvador to analyze, discuss, and adopt joint solutions to the situation in Central America after Hurricane Mitch.

The XX Summit of Presidents of Central America was suspended because of the hurricane, but its agenda had included a discussion of the subregion's vulnerability to natural disasters. During the November meeting, the presidents of Costa Rica, El Salvador, Honduras, and Nicaragua, and the Minister of Foreign Affairs of Guatemala resolved to:

- instruct sectoral cabinets to deal, in a concerted manner, with health, agriculture, environment, and infrastructure problems caused by Mitch.
- instruct national authorities to continue dealing with the effects of the disaster in the wake of the postponement of the Summit.
- promote the need to develop mechanisms for natural disaster prevention and mitigation with full community participation.

For a copy of the statement issued by the Presidents at this meeting (Spanish only), contact the General Secretariat of the Central American Integration System (SICA) at e-mail: sgsica@sicanet.org.sv or fax (503) 289-6124. ❑

Another Step toward a Global Disaster Network

Information centers and organizations from 17 countries in the Americas, Asia, Africa and Europe participated in the International Meeting of Disaster Documentation Centers in November, 1998 in Costa Rica, organized by PAHO/WHO in collaboration with the IDNDR and CRID.

Information specialists and disaster experts analyzed the possibilities of regional and global collaboration to increase the dissemination of technical information on disasters and emergencies and make it available to users. The meeting produced important conclusions on the need to form a global network of documentation centers, strengthen existing centers and the use and development of technical information products for disseminating information on the Internet and CDROM.

The conclusions of this meeting are available at http://www.paho.org/spanish/ped/pedhome.htm (click on "Important Meetings") or e-mail perezric@paho.org. ❑

ECLAC Mission Assesses Socioeconomic Impact of Hurricane Mitch

Due to Hurricane Mitch's formidable impact on the majority of Central America, ECLAC organized two missions to evaluate the socioeconomic effects of this in Guatemala, Honduras, Nicaragua and El Salvador.

The information for the most part, came from national agencies, as well as from collaboration with regional and international institutions such as UNDP, PAHO/WHO and SICA.

PAHO/WHO worked closely with ECLAC's missions to collect data from and prepare rehabilitation/reconstruction projects for the health sector.

For more information on the results of these evaluations contact: Ricardo Zapata Marti of ECLAC at fax: (525) 531-1115; e-mail: rzapata@un.org.mx. ❑

Stress Management Now a Part of Disaster Training

At present, none of the English-speaking or French-speaking Caribbean countries has an established network to deal with stress after disasters. And so, a regional team has been established to adapt the material from a BVI workshop on Critical Incident Stress Management for the Caribbean. The team has completed an outline for a short session, which will be included as part of the PAHO course on Medical Management of Disasters (MMD). It is also developing the course material for a two-day session. The course is now known as Stress Management in Disasters (SMID) and targets primarily emergency response workers.

Input from these sessions will be used to develop an adapted model for the Caribbean. A draft document will be available in the near future. For further information on SMID please contact PAHO's Disaster Preparedness Program in Barbados, fax: (246) 436-6447 or email: dvanalphen@pahocpc.org. ❑

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(from pg. 4)

Hurricane Georges

Despite the devastating blow that Hurricane Georges dealt to the Caribbean, in some ways it was overshadowed one month later by the international coverage that focused on Hurricane Mitch. Nonetheless, Georges seriously affected the health sector of the Dominican Republic, Haiti and several countries of the English-speaking Caribbean, particularly Antigua and Barbuda and Saint Kitts and Nevis. The information that follows was excerpted from national reports prepared in the wake of Hurricane Georges. See page 1 for information on how to obtain the complete report.

Dominican Republic

Hurricane Georges was catastrophic in the Dominican Republic, with winds reaching 120 plus miles per hour and intense and prolonged rainfall that caused rivers and dams to overflow. Two hundred eighty-three people died and ECLAC estimated damages to all sectors to reach US$2 billion.

Although in the pre-disaster phase emergency plans and prevention measures could have been implemented sooner, once the hurricane struck, the Ministry of Public Health, together with other national agencies and international organizations, assumed leadership in mitigating the health effects and preventing outbreaks of diseases.

The health sector's post-disaster response activities were less affected by the actual impact of the hurricane than by the difficulties imposed by a lack of drinking water, the proliferation of disease-transmitting vectors, flooding, problems with drainage and collection of solid waste, food handling and overcrowding in temporary shelters.

Haiti

The mountains that separate the Dominican Republic from Haiti on the island of Hispaniola helped to diminish wind velocity as Georges entered Haiti on 23 September. But the hurricane, with its heavy and prolonged rains, caused serious damages in this country already suffering from a fragile economy and social infrastructure.

The most affected sectors were environmental health and drinking water, vector control and the epidemiological surveillance system. The cost of rehabilitation in the first two sectors was estimated at US$414.5 million; in the latter at US$515 million.

While the hurricane itself did not destroy any hospitals, in many cases pre-hurricane conditions in these facilities had left them vulnerable to the heavy rains and flooding. However, the hurricane may have provided the window of opportunity needed to continue the national policy of strengthening and rehabilitating the physical health infrastructure, a program that was already underway prior to the disaster. The hurricane also worsened existing problems in the water and sanitation sector and this placed the population at grave risk.

To protect costly investments, repairs to disaster-damaged health facilities must include mitigation measures. Had this been done earlier, the roof of the JN France Hospital might have survived Georges.

Photo: PAHO/WHO, A. Waak

St. Kitts and Nevis

The JN France Hospital is the only secondary-care health facility in St. Kitts and Nevis and since opening in 1966, has suffered significant hurricane damage on ten separate occasions. The recent severe damage to several of the hospital's roofs was caused by water that entered from the roof, rather from the windows as had been expected and which had been boarded up before the storm. Having previously been devastated by Hurricane Luis in 1995, the roof of the JN France was, once again, destroyed.

Total health sector damage was estimated at US$4.5 million; lesser damages occurred to smaller health clinics and on the island of Nevis.

Thanks to funding from multilateral and bilateral donors, PAHO is focusing rehabilitation efforts on the maternity, pediatric and medical wards, and on the laboratory and eye clinic of the JN France. All external walls and several of the internal walls will be strengthened to become earthquake-resistant, and roofs will be completely replaced.

The vulnerability to disasters of the rehabilitated JN France Hospital is expected to be sufficiently low so that evacuation during hurricane warnings need not be necessary and the facility can function immediately following future hurricanes and earthquakes.

Antigua

Although Hurricane Luis left more widespread damage in 1995, Hurricane Georges did cause a major disruption of services in the Holberton Hospital (loss of power and the main water supply).

Many wards in the Holberton Hospital needed to be repaired following Luis, and those which had incorporated disaster mitigation measures into the rehabilitation efforts did not again fall victim to Georges. There was much less damage to other health centers and clinics, and island-wide, most operations were back to normal within one week.

Review of Publications

Accidentes químicos: Aspectos relativos a la salud. Guía para la preparación y respuesta

PAHO has published this guide was produced in collaboration with representatives from several international organizations at the workshop *Health Aspects of Chemical Accidents* which took place in 1993 in Utrech, Netherlands.

This publication contains three guideline documents: Guía General, Guías Prácticas and Síntesis: Acciones Esenciales. The Guía General is directed at decision-makers and authorities for developing appropriate policies for prevention, preparation and response to chemical accidents. The Guías Prácticas is a more detailed and technical approach to response and preparedness geared toward the operational sector. The third part: Síntesis: Acciones Esenciales is a summary list of the basic measures needed to plan and execute prevention and preparation and response. Two annexes and an extensive bibliography complete the publication.

We encourage you to download the full-text document (in PDF) from our web site: http://www.paho.org/english/ped/pedpubs.htm. Order a hard copy by e-mail from disaster-publications@paho.org or fax: (202) 775-4578. Available only in Spanish. ❑

CRID Publishes New Bibliographies

Even though CRID's database, DESASTRES, can be accessed through the Internet, the Center continues to publish *Bibliodes* and *Desindex* to increase usage of the database by those who have difficulties accessing the Internet. Desindex No. 6 contains references to 1500 documents which may be searched using the available indexes. There are a limited number of copies available for organizations, libraries and documentation centers.

Edition No. 26 of Bibliodes, titled "The Prevention of Disasters Begins with Information", includes bibliographic references related to the themes of communication methods, information systems, Geographic Information Systems, Telemedicine and Telecommunications.

To receive *Bibliodes* or *Desindex*, contact CRID (see page 8) or search the database online at: http://www.disaster.info.desastres.net/crid/. ❑

Upcoming Meetings

V International Congress on Disasters

The V International Congress on Disasters will be held September 7-10, 1999 in Havana, Cuba. This Congress is organized by several national organizations with support from PAHO, IDNDR and UNICEF, among others. The objective of the conference will be to convene environmental, economic and development specialists to exchange information and build networks for bilateral cooperation. For more information please contact Migdalia Luna Cisneros, fax: (537) 21-8382 or email: migdalia@palco.get.cma.net. ❑

Disaster Management and Medical Relief

The International Conference on Disaster Management and Medical Relief will take place 14-16 June 1999 in Amsterdam, Netherlands. The conference will encourage discussion of the community's 'right to safety'; exchange information about disaster medicine and highlight its operational and technical chances and constraints. For more information contact: dmmr@minbiza.nl or fax: +31 (0) 70-302-1444. ❑

Tool for Management and Good Governance

(from pg. 1)

Following Hurricane Mitch, the SUMA system proved itself to be a valuable technical tool that helped relief operations managers demonstrate a commitment to transparency and good governance. The humanitarian supply management system, developed a decade ago by PAHO with the support of the Colombian Red Cross, aids countries to manage information on all humanitarian supplies, regardless of ownership or destination.

In Honduras, for example, most agencies—from the Office of the First Lady to the local Red Cross—used SUMA to gather data, under the supervision of the national office that oversees expenditures. This collaboration was made possible thanks to an open policy of access to information for operational purposes and accountability at the national level.

Information is a powerful tool in disasters. However, it is vulnerable to misuse and mismanagement. Data on humanitarian supplies must be circulated openly and subjected to review and criticism. This is where SUMA plays an important role. An externally-monitored inventory of donations, along with the dissemination of this information, goes a long way toward dispelling potential rumors of a massive disappearance of international aid or other problems. Without an open policy of transparency, primarily within the coordinating agency of governments, the ultimate objective of collaboration and accountability is lost.

Particularly in emergency situations, information belongs to the public in the affected country and to the international community at large. Secrecy and obfuscation are things of the past. ❑

Do we have your E-mail address?

If you would like to receive short, periodic news items electronically, send your e-mail address to disaster-newsletter@paho.org.

News from PAHO/WHO

(from pg. 2)

breaks were rapidly controlled. This increased surveillance laid to rest the generalized fear that Mitch would automatically unleash large-scale epidemics.

In December, health ministers of Central America signed the Costa del Sol Declaration which calls for the reinforcement of national anti-cholera programs in the areas of information, epidemiological surveillance, community awareness, environmental clean-up, water chlorination, and safe food handling practices. PAHO has pledged US$ 1 million in support.

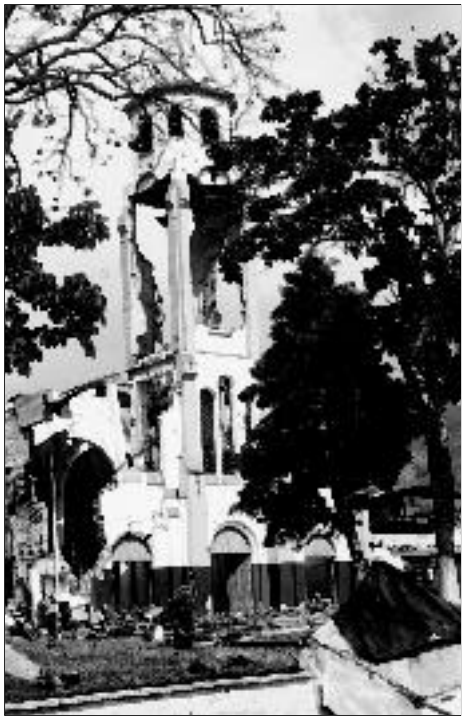
Now that the emergency phase is over, repair and rehabilitation of the health network could take up to 18 months. During this time, the bulk of PAHO's technical cooperation activities in Central America will be reprogrammed to reflect new realities and new needs.

Earthquake in Colombia

Immediately after the earthquake struck in January, the PAHO/WHO office in Colombia quickly mobilized advisors in epidemiological surveillance, environmental health problems and water supply systems, zoonosis and vector and rodent control, and health services and first aid. Meanwhile, a SUMA team was quickly sent from Quito, Ecuador. The PAHO/WHO Representative served as the U.N. System Coordinator, ad interim.

During the first 24 hours following the earthquake, PAHO launched an emergency appeal for funds to strengthen cooperation in the fields mentioned. Several governments responded generously, and these funds made it possible to strengthen national and international assessment and SUMA teams, and send and operate satellite telephone equipment. This equipment made emergency communication from Armenia, Colombia (the hardest-hit city) possible and allowed updated information to be received directly from the affected area.

Experts in the construction of temporary emergency latrines are also advising the local authorities on how to build these modules which were very useful in similar earthquakes in Bolivia. ❑



Armenia, Colombia, January, 1999.
Fotografía: OPS/OMS, Colombia

Selected Bibliography

The articles listed in this section may be of interest to health professionals and others responsible for disaster preparedness, mitigation and relief. They have been reproduced and recently added to the collection of articles available from the Editor of this Newsletter. *A complete list of reprints is available upon request. Please quote the reference code listed to the left of the publication title when requesting articles.*

X.4 PAHO/WHO, "El impacto del huracán Mitch en Centroamérica," Boletín Epidemiológico de la OPS, Vol. 19, No. 4, 1999.

X.5 INCAP, "La seguridad alimentaria y nutricional en situaciones de emergencia," Instituto de Nutrición de Centro América y Panamá.

X.6 Berckmans, Patrick et al, "Inappropriate drug-donation practices in Bosnia and Herzegovina, 1992 to 1996," *The New England Journal of Medicine*, Vol. 337, No. 25, pp. 1842-5, Dec. 1997.

X.7 Benini, Aldo A., "Uncertainty and information flows in humanitarian agencies," *Disasters*, Vol. 21 No. 4, pp. 335-53, 1997.

X.8 Armenian, Haroutune K. et al, "Deaths and injuries due to the earthquake in Armenia: A cohort approach," *International Journal of Epidemiology*, Vol. 26, No. 4, pp. 806-13, 1997.

X.9 Mitchell Grant, Susan et al, "Psychological evaluations, referrals, and follow-up of adolescents after their exposure to Hurricane Hugo," *JCAPN*, Vol. 10, No. 1, pp. 7-16, Jan.-March, 1997.

Disasters: Preparedness and Mitigation in the Americas is the Newsletter of the Emergency Preparedness and Disaster Relief Coordination Program of the Pan American Health Organization, Regional Office for the Americas of the World Health Organization. The reported events, activities and programs do not imply endorsement by PAHO/WHO, nor do the statements made necessarily represent the policy of the Organization. The publication of this *Newsletter* has been made possible through the financial support of the International Humanitarian Assistance Division of the Canadian International Development Agency (IHA/CIDA), the Office of Foreign Disaster Assistance of the U.S. Agency for International Development (OFDA/AID), and the Department for International Development of the U.K.

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The Devastating Path of Hurricane Mitch in Central America

No. 1 A Supplement to Disasters: Preparedness and Mitigation in the Americas January 1999
the quarterly newsletter of PAHO/WHO

PAHO/WHO, C. Osorio

There will never again be a hurricane named Mitch, and that's bad news. *Only the most devatating of storms have their names retired. On 24 October 1998, Tropical Storm Mitch turned into a full-fledged hurricane and pummeled the Caribbean coast of Central America for more than 48 hours, with winds of up to 295 kilometers an hour. Approximately 48 hours later, reverting to Tropical Storm status, Mitch caused heavy and continuous rains that affected the entire region, but more severely in Honduras, Nicaragua, El Salvador and Guatemala. The final count reflects alarming figures of up to 25,000 dead or missing, and hundreds of thousands affected from the destruction caused by floods. Losses in economic terms are incalculable since damages were felt in all of the production sectors of the affected countries. Following is a summary of the effects of this disaster on the Central American countries.*

Honduras

Hurricane Mitch appeared in Honduras on 26 October, and as it slowly moved up the country's northern Caribbean coast with devastating winds of approximately 250 kilometers an hour, caused torrential rains over a period of four days.

On 30 October, after causing damages on the islands of Bahía, Mitch moved quickly inland to the south where it weakened to a tropical storm. The ensuing torrential rains continued for five consecutive days, causing massive floods in 18 of the country's departments. The entire Caribbean coast of this country was affected, as well as the capital of Tegucigalpa and the south.

Estimates indicated some 1.5 million persons were affected, more than 6,000 dead, 8,000 missing and 12,000 injured. More than 285,000 were left homeless and took refuge in 1,375 temporary shelters.

The damages in Tegucigalpa alone were calculated at approximately US$ 250 million. About 60% of the country's road infrastructure was severely damaged, and over 70% of the coffee, banana and pineapple production was destroyed. Approximately 80% of the country's water supply system was damaged, and some 100,000 latrines and the sewage system in Tegucigalpa were also destroyed. Twenty-five percent of the country's schools were damaged. Total losses are estimated at over US$ 5 billion.

Twenty-three of the country's 30 hospitals were totally destroyed or suffered partial damage to their water distribution system. One hundred twenty-three health centers were seriously damaged, and 68 of them left non-operational at a time when some 100,000 persons required medical assistance for diarrhea, acute respiratory infections, dermatitis, conjunctivitis and other illnesses.

A National Emergency Commission was created at the highest level of government during the emergency. A Reconstruction Cabinet was also created, composed of the Ministers and other high-ranking officials, to conduct the transition phase and follow up on the implementation of reconstruction projects. International cooperation was generous and swift to the official appeal for help. The United Nations System, neighboring countries and bilateral and non-governmental organizations mobilized humanitarian assistance in the form of human resources, logistics and cash.

Disaster preparedness activities and measures taken prior to the disaster, and the installation of an Operations Center to coordinate activities in the immediate aftermath, ensured a timely response by the health sector. In many cases, it was necessary to improvise medical services in

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churches, schools, tents and other places, through the mobilization of brigades. The Health Secretariat exhausted its supply of medicine for the treatment of infectious diseases. Substantial efforts were directed to improving drinking water quality, and the mass media and other public information outlets were employed to help prevent water contamination.

Thousands of pools of stagnant water caused by the floods, together with the high temperatures, created a massive breeding ground for insects carrying malaria and dengue. To control this situation, personnel was mobilized to evaluate the entomological situation, insecticides and fumigation equipment were procured, and health staff was trained on the safe handling and use of insecticides and spraying equipment.

Epidemiological reporting decreased from 70% to less than 30% after the hurricane, because of damage to ground transportation and the isolation and scarcity of field epidemiologists. In order to respond to this crisis, a reporting form was created to be used in the shelters. After the first six weeks, a decrease was noted in the number of mandatorily-reported cases in the shelters, while at the same time the number of persons in the shelter also decreased.

Evaluation of the hurricane's effects on the health sector should be placed in the context of health conditions prior to the disaster. Honduras had very low health indicators and the government had begun implementing a very important sectorial reform, the "New Health Agenda". This has now been postponed to a time when the health conditions are less precarious and the population and health care facilities have recuperated from the damages.

Hurricane Mitch was a major Internet-intensive disaster

Nicaragua

Among the most dramatic effects from Mitch was the collapse of the southern flank of the 'Casitas' Volcano, located to the northeast of Managua. The devastating mud and rockslides that ensued buried five communities and caused thousands of deaths. Lake Managua's water level rose, flooding sectors of Managua, the capital, and the nearby town of Tipitapa, destroying settlements along its banks and forcing over 2,000 people to be evacuated.

Nicaragua's Banco Central estimated that damages reached US$ 1.5 billion, mainly in housing losses (17% were affected), roads, power generation and distribution, drinking water supply systems, health infrastructure (one hospital, 90 health centers and more than 400 health outposts were damaged to some degree), and education, among others. This figure does not include losses in the agricultural sector nor environmental impact.

Initially, the number of affected persons was estimated at 870,000, with a preliminary figure of 2,400 deaths. The most affected departments were Chinandega, León, Matagalpa and Jiotega. Sixty communities were left totally isolated, 21 without drinking water, 15 without electricity and 56 with no communications. Approximately 33,000 persons had to be temporarily evacuated.

An important part of the primary health care system was lost due to the destruction of and damage to health centers and outposts. An increase was observed in acute respiratory infections, diarrhea, and increases in reported cases of dengue and malaria. Overcrowding in shelters also caused health problems.

The Ministry of Health dealt with the emergency by mobilizing human resources, medicine and supplies to the affected areas, initially with its own funds, and later with the support of the international community. Expeditious epidemiological surveillance measures were put in place in shelters and communities, while massive educational campaigns instructed the population on how to make drinking water safe, handle and prepare food, and other health measures and basic sanitation.

The process of reforming the health sector, implemented by the government before the emergency to respond to the growing needs to organize and plan health services, should continue simultaneously with the reconstruction process. In this way, Nicaragua can improve its health indices and respond to the needs of the population, especially in rural areas.

El Salvador

Compared to the effects in neighboring Honduras and Nicaragua, Hurricane Mitch caused relatively moderate damage in El Salvador. The impact was localized in rural areas, especially along the coastal plains.

Casualties included 240 dead, 20 missing and almost 85, 000 affected in five departments of the country. The total cost of losses, according to ECLAC, was US$261 million, mainly in agriculture, water and sanitation, housing and infrastructure.

The National Emergency Committee (COEN) provided effective coordination between governmental and non-governmental organizations, international agencies, response organizations such as the Red Cross, fire fighters, rescue squads, etc.

In the area of environmental health, the most severe damage was to water and sanitation systems, including the flooding of wells and contamination of latrines, septic tanks and sewerage systems.

Due to the risk of prevailing diseases in Nicaragua, or contamination from neighboring countries, specifically cholera and other water-borne diseases, leptospirosos, dengue and malaria, the Ministry of Health focused heavily on epidemiological surveillance, health education, vector control and waste control in affected areas. Damage to infrastructure and equipment in health facilities was moderate, even though it is estimated that the indirect costs of medicine, vector control and water quality monitoring were considerable.

An estimated 16 health units were affected, 155 water systems, 14 sewerage systems and more than 7,000 wells and latrines damaged.

The tropical storm affected coastal areas where water supply systems provide only 25% of the drinking water, and where the principal source of water comes from wells. As was the case in other countries, stagnant water increased mosquito transmission of dengue and malaria.

The government of El Salvador has defined an agenda for emergency response and for reconstruction in three phases: an immediate phase from November 1998-June, 1999; an intermediate phase during 1999-2000, and a long-term phase from 2000-2025. The agenda has taken into account intervention projects, their cost, and sources of financing for each phase.

Guatemala

In the case of Guatemala, the hurricane moved more slowly. This, together with a national disaster prevention program that made it easier to alert and evacuate the population at risk, contributed to the fact that damages were much less severe than in the other countries.

The National Disaster Reduction Commission (CONRED) estimated that more than 100,000 persons were evacuated, 268 died and 110,000 were affected by Mitch. Roads were severely damaged, but in the majority of cases, temporary routes were established for surface communication to the majority of the towns and communities in the country.

The government declared a state of emergency and requested assistance from international organizations and donors. This was channeled through CONRED and distributed to the affected population, as well as being used to implement the rehabilitation and reconstruction process.

The health services network reported little damage, in general terms. A total of 50 health centers and outposts need to be rehabilitated in terms of infrastructure, water supply, electric systems, and surveillance control. Two centers suffered considerable infrastructure damage. It is estimated that at least 396 communities either lost or were left with damages to their water supply systems, and that at least 20,000 latrines were destroyed.

The government's plan to respond to the emergency focused on supplying water, treating water for human consumption, and on the control of cholera and leptospirosos. Water quality surveillance programs are calculated to cost more than US$200,000, and US$3.85 million is needed for the rehabilitation and reconstruction of damaged water supply systems. Similarly, there was a campaign to improve and control food handling.

As for epidemiological surveillance, the health authorities considered that 12 of the country's departments were in critical risk of exposure to diarrheal diseases. A health team, made up of epidemiologists, sanitation technicians, specialists in vector control, and other disciplines, was sent to each department to provide technical support. There was a significant increase in reported cases of cholera, malaria and classic dengue.

The health sector in Central America had made substantial progress prior to Hurricane Mitch

In the last decade, the countries, including those affected by social conflict, have continued to invest in the health sector. This effort has translated into significant health achievements:

- A reduction in infant mortality from 65 per 1000 live births in 1980-85 to the current 36 per 1000 live births.
- An increase in immunization coverage for infants under one year of age, particularly for measles, from 33% in 1980 to 87% in 1997.
- Eradication of the wild polio virus.
- A commitment to eliminate measles, which is currently in recession.
- A 65% reduction in deaths from infectious diseases in the period 1980-1995.
- An increase in access to drinking water services from 50% in 1980 to 67% in 1997.
- Increased life expectancy from 59.3 years in the period 1975-1980 to 68.0 years in 1995.

However, without a massive investment in health, the negative impact of Hurricane Mitch on the achievements of the health sector will be accentuated, affecting reconstruction efforts and social stability.

SUMA meets the challenge of a multicountry disaster

During the last days of October 1998, Hurricane Mitch ravaged all the countries in Central America. Honduras and Nicaragua were the most severely affected. In the first days of November, PAHO/WHO (through FUNDESUMA, a non-governmental organization dedicated to improving disaster supply management), received requests from authorities in the affected countries to install SUMA. Experts were mobilized from throughout the Region to implement the SUMA methodology. Following are a few of the highlights of this operation.

Honduras

COPECO, the national emergency commission and the Ministry of Health fully supported the installation of SUMA. Several warehouses and field units were installed at the main airports to register incoming supplies. Honduras was the only country where field units were installed at a maritime port, Puerto Cortez, on the Atlantic. These warehouses continue operating to this day under the management of COPECO and the Ministry of Health; several are also managed by NGOs such as the Red Cross, Fundación María, the Honduras chapter of Caritas, and private organizations such as the Fondo Cafetero (Coffee Fund).

One of the main problems encountered was the lack of training among some institutions (which had not been involved in preparedness activities prior to this emergency). This made it essential to conduct short training courses in general disaster management and issues related to supply management in the middle of the emergency itself.

Despite economic and organizational problems, the national authorities in Honduras were fully willing and interested in providing transparency and accountability in supply distribution to the affected population, which was achieved in great measure.

The 2,000 professionals who have been trained in the SUMA methodology throughout the Region are volunteers, and when disaster strikes their country, they generally must assume their normal responsibilities. However, this pool can be tapped to deploy experts to neighboring countries when national teams are not available.

Nicaragua

Implementation of SUMA began late in this country. The Civil Defense did not decide to use this supply management tool until 18 November, only after a large amount of relief had already arrived. The National Emergency Committee's Executive Secretariat gave instructions to many government agencies to install SUMA and field units at the international airport, at the central level of Civil Defense (which consolidates all information) and in warehouses in the Ministry of Health, the Red Cross and other NGOs. It was interesting to observe the interest shown by several NGOs and institutions at the local level. They assigned staff to the most affected areas to strengthen their supply management systems at the local level with excellent results.

El Salvador

The installation and use of the SUMA system in this country enjoyed strong support from the Presidency and the Council of Ministers, and was even deemed as the standard for supply management. The national agency in charge, the National Emergency Committee—COEN—has given its full support to the use of SUMA in a variety of previous experiences. Field units were installed at the international airport and in various warehouses, including the Ministry of Health.

Guatemala

The effects from the hurricane were serious, although not of the magnitude in Honduras or Nicaragua. The National Committee for Disaster Reduction—CONRED—is responsible for supply management to the affected population, from storage to distribution. In coordination with other Ministries, especially the Ministry of Health and Social Welfare, SUMA coordination points (SUMA Central) were installed in CONRED and in some warehouses. Supply management of medicine was conducted exclusively at the Ministry of Health's warehouse. Although human resources were insufficient to meet the needs, pharmacology students collaborated in the medication warehouses, which contributed greatly to the operation.

Conclusions

- Supply management is best begun very soon after the impact, when search, rescue and assessment activities are winding down of have concluded. However, modern communications and the immediate availability of transportation allow the arrival of supplies to begin directly after the impact, creating an overlap with search and rescue and evacuation of the injured. This overlap produces a heavy workload for national organizations, which find they cannot carry out all activities and meet demands.
- Although SUMA has trained almost 2,000 officials throughout Latin America and the Caribbean, they are almost never available at the time of a disaster, so SUMA teams must be mobilized from neighboring countries.
- The adoption of a supply management system by disaster-affected countries, which openly reflects how the supplies are managed, is a very clear measure of the willingness, on the part of governments, to have humanitarian assistance reach those who really need it.

For more information

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