

DISASTERS

PREPAREDNESS AND MITIGATION IN THE AMERICAS



Issue No. 80

News and Information for the International Disaster Community

April 2000

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Identifying Cadavers Following Disasters: Why?

One of the most common myths associated with natural disasters is the myth that cadavers are responsible for epidemics. In many cases, the management of cadavers is governed by the false belief that bodies represent a serious threat of epidemics if they are not immediately buried or burned. This threat is used as a justification for widespread public health malpractice that gives top priority to mass burial or cremation of victims. More than simply being scientifically unfounded, this practice leads to serious breaches in the principle of human dignity by depriving victims of an appropriate identification and disposal of their body.

The debate about the issue of mass disposal of bodies of victims who have died from trauma due to a disaster cannot be solely confined to the public health arena. In fact, in this case, public health is a non-argument. This remains a problem despite the fact that in most countries, domestic laws provide a series of requirements for the proper disposal of bodies.

The real challenging argument for the appropriate management of dead bodies is the recognition

that identification and proper disposal of a dead body—if not clearly and unambiguously in legal terms a basic human right—is at least a basic human need.

When someone dies, there is not only a legal, societal need to identify the person, but also the human need for the moral comfort of his/her relatives. Following the July 1995 massacre in Srebrenica, Bosnia, for more than a year the women of Srebrenica demonstrated in the streets of Tuzla, demanding to know from humanitarian agencies, the United Nations and the Red Cross, if their husbands were still alive and being kept prisoner or had been massacred. The mental anguish of survivors is no less following natural disasters and yet in many instances we have witnessed unnecessary precipitous mass burials. Contrast that to the seemingly endless efforts by the U.S. Government, even 25 years after the end of the Vietnam War, to obtain some means of identification of still unaccounted for MIA/POWs. Are the needs of the relatives of hurricane or earthquake victims less important?

(cont. on page 7)

L.I.D.E.R.E.S. > A Course For Managers in Health, Disasters and Development

No longer is it enough to have an excellent technical grasp of the epidemiological consequences of disasters or the structural vulnerability of hospitals. Today, the decentralization and reform processes that are underway in the countries of the Region have significantly changed the tasks of the national disaster program

coordinators. At the same time, the globalization of humanitarian assistance has stimulated the interest of a greater number of new actors with whom the national authorities must interact. Among them are financial organizations, NGOs and foreign militaries.

(cont. on page 2)

News from PAHO/WHO

A Snapshot of Donations to Venezuela



SUMA, the Humanitarian Supply Management System, was in place in Venezuela immediately following the December 1999 floods. The system captured very detailed information on incoming humanitarian relief that poured into the

country, making it possible to confirm several longstanding observations:

- Local communities are the first to help. The initial response was from the country itself. SUMA began registering incoming donations from other parts of Venezuela on December 17, the day after the rains ceased. Nine days later, SUMA began registering the first foreign aid donations.
 - International assistance arrives later, but in abundance. Foreign donations registered by SUMA outnumbered local ones. Two-thirds of all in-kind donations came from the international community.
 - The system can become clogged with non-priority items. More than half of medicines received were not urgently needed.
- Snapshots such as these confirm the need for a

global education campaign on in-kind donations, a step called for in the last issue of this newsletter.

For more information on the flow of donations to Venezuela, compiled by SUMA, please visit www.disaster.info.desastres.net/SUMA/. □

WHO Guidelines for Vegetation Fire Events Available Online

The WHO-UNEP-WMO Guidelines for Vegetation Fire Events (see issue 77 of this newsletter) is available online at www.who.int/peh/ (click on "Air" and then on "Vegetation Fires"). Background papers and the teacher's guide are also available at the same address. □

Radiation: Before, During and After Radiological Emergencies

PAHO has just translated this technical reference document and adapted it for Latin America and the Caribbean. This Spanish-language adaptation (it was originally published by WHO in English) is designed to improve the response to this type of accident in the Americas and is especially directed to local authorities. It is a useful reference volume for developing educational plans, preparedness measures, response plans, and mitigation programs for nuclear or radiological accidents. A limited number of copies is available in Spanish from the CRID (see page 8). □

LIDERES

(from pg. 1)

In order to tackle this increasingly complex situation, PAHO/WHO is organizing **LIDERES**, a course to respond to the demands of institutions that can no longer rely solely on professionals knowledgeable about disasters, but rather, urgently require managers.

This international course will focus on the managerial aspects of disaster reduction programs, from prevention to response to risk management, covering topics such as the globalization of relief, decentralization, information management for decision-making, project preparation, negotiation, mobilization of funds, the organization of work in

unsafe areas, and transparency in relief management.

This first course will be conducted in Spanish and held in Quito, Ecuador from 28 August to 15 September and will be limited to 24 participants.

Following the model of other international courses, a registration fee of US\$1,500 will ensure sustainability of this event. An additional US\$1,300 will be charged for lodging, food and local transportation. The deadline to register is **15 July**. For more information contact: curso-lideres@paho.org. □

Other Organizations

HELP 2000: Health Emergencies in Large Populations

This three-week course is designed to develop or improve the skills of persons and organizations providing emergency health services in humanitarian emergencies. In 2000 it will be held from July 10-28 at the Johns Hopkins School of Public Health, Baltimore and from 17 July-4 August in Honolulu at the University of Hawaii.

Topics covered in the course include planning, food and nutrition, environmental health, communicable diseases, health services, epidemiology, humanitarian ethics and international humanitarian law. The courses are co-sponsored by the International Committee of the Red Cross (Geneva), the American Red Cross and PAHO. Contact Dr. Gilbert Burnham, fax: (410) 614-1419; e-mail: helpcour@jhsph.edu. □

Disaster Management Certificate Offered

The Center of Excellence in Disaster Management and Humanitarian Assistance (CEDMHA) and the University of Hawaii-Manoa introduced a new multidisciplinary training and research program leading to a Certificate in Disaster Management and Humanitarian Assistance. The new program will draw on the Asia-Pacific expertise of the university faculty and the extensive field experience of CEDMHA staff. Participants will include both civilian and military students.

For additional information contact CEDMHA fax: (808) 433-1757; <http://coe.tamc.amedd.army.mil> or e-mail: jwhite@hawaii.edu.

Saving Older People's Lives in Emergencies

Older people, especially older women, are a significantly vulnerable group in disaster situations. HelpAge International's new guidelines for best practices in humanitarian crises and disasters, *Older People in Disasters and Humanitarian Crises*, show how aid agencies can meet older people's needs and recognize their potential in emergencies. Simple changes in practices and attitudes can often make the difference between death and survival.

These guidelines are available in English,

French, Portuguese and Spanish. The full document is posted in English at www.helpage.org.

For further information contact HelpAge International, fax: (44-020) 7404-7203; e-mail: press@helpage.org. □

World Disasters Report 2000

The International Federation of Red Cross and Red Crescent Societies (IFRC) will publish the World Disasters Report 2000 on 29 June 2000. The focus this year is on public health in disasters, and covers assessing and targeting public health priorities, AIDS in Africa, the Kosovo crisis, the need for legislation in disaster response, the quantity of aid, plus a "disasters" database with statistics on disasters and epidemics (supplied by the Center for Research on the Epidemiology of Disasters in Belgium) and refugees (from the U.S. Committee for Refugees). The publication will be available online at www.ifrc.org/pubs/wdr/. For more information please contact: Isabelle Grondahl, e-mail: tempcom2@ifrc.org. □

Volcanologists Chat Online

A new tool for direct online discussion has been introduced by the University of Rome's Physics Department. This tool may be accessed free of charge at: <http://vulcan.fis.uniroma3.it/message/v-board/start.html>. □

ADPC Course Focuses on Community-Based Management

The Asian Disaster Preparedness Center will host the Fourth International Course on Community-Based Approaches to Disaster Management from 3-14 July 2000 in Bangkok, Thailand.

The course will provide enhanced understanding of community-based approaches to disaster risk management through strengthening of local capacities. It will highlight the importance of collaborative working and development of strategies for local level partnerships between government, local officials and communities to achieve more advanced preparedness.

Nominations are invited. To obtain applications and more information, please contact ADPC at e-mail: tedadpc@ait.ac.th; fax: (662) 524-5360, or visit their website at: www.adpc.ait.ac.th. □



Member Countries

Seminar on Environmental and Technological Emergencies

OCHA and the Federal University of Parana, Brazil are organizing a seminar on 5-9 June, 2000 for disaster professionals to strengthen regional capacity in responding to disasters and to promote the response system used by the UN as well as several tools used in evaluation and coordination, including the response to environmental emergencies. More information may be found at:

www.geologia.ufpr.br/ochaundac or by email: monteiro_pereira@un.org. □

Caribbean Discusses Environmental Management

On April 6-7, PAHO's Office in Barbados held a seminar on post-disaster environmental management to define the roles of each country's environmental sanitation program in disaster situations, in terms of vector control and water and food sanitation. Participants also looked at PAHO's role in assisting in the transparent management of international donations and aid.

Representatives attended the seminar from Anguilla, Antigua and Barbuda, Barbados, BVI, Dominica, Grenada, Guyana, Puerto Rico, St. Christopher and Nevis, St. Lucia, St. Vincent and the Grenadines and the U.S. Virgin Islands. Support for the meeting was also provided by the Centers for Disease Control (CDC), which in the past few years has been involved in post-hurricane environmental evaluations in the United States.

Contact: yanalphd@paho.cpc.org. □

Follow Up on Volcanic Emergency in Ecuador

Following is an update on health sector response to the continued volcanic activity in Ecuador.

Epidemiological surveillance

The Ministry of Public Health is publishing the newsletter **Volcanes**, to provide information on the effects of volcanic eruptions on the health of Andean populations; specifically, the correlation between volcanic ash fall and respiratory problems, conjunctivitis, tuberculosis and asthma. The Newsletter is available at www.disaster.info.desastres.net/PED-Ecuador/desastre/boletin_volcanes.htm.

Mental health

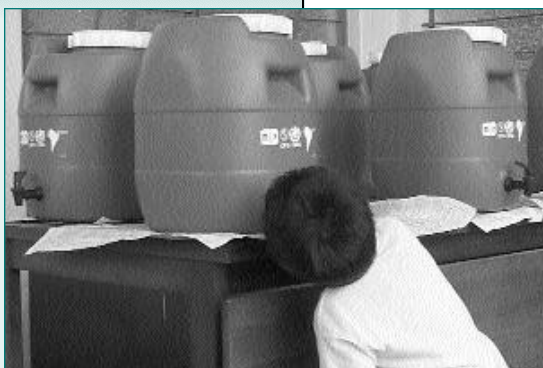
Monitoring of the health situation has detected some cases of post-traumatic stress disorder in the affected population. Psychologists from the Ecuadorian Red Cross are working with volunteers to counsel those forced to migrate out of rural areas affected by ash fall and who have so far received very little humanitarian aid.

SUMA

Due to governmental reorganization, SUMA equipment is being transferred from the Housing Department to the Civil Defense, where the emergency situation is now being managed. A new coordinator is being trained in the role and operations of SUMA.

Water and sanitation

Nearly 80% of the drinking water systems located in the ash fall risk zone of both volcanoes have been covered with protective plastic. In some rural water systems alternative methods have been implemented using natural materials to cover water sources and systems. The same affected communities have received training and materials for disinfection of water supplies.



Safe drinking water is always one of the most critical needs.

Photo: PAHO/WHO

FAHUM Civilian-Military Meeting

From 14-26 February 2000 a civilian-military meeting funded by the US Southern Command was organized in Santo Domingo, Dominican Republic. Over 500 persons from Latin America and the Caribbean participated, as well as US military. The objectives were to enhance coordination of international, governmental and non-governmental agency relief operations during disasters and to promote civilian-military cooperation.

During the first week the Office of U.S. Foreign Disaster Assistance (OFDA) conducted a workshop on damage assessment, needs analysis and emergency operation center management. A desktop simulation exercise tested the different countries' EOC disaster plans. Disease surveillance, water and sanitation vector control and mass casualty management were included in the response scenario.

(cont. on page 5)

This exercise increased awareness of available resources in the region and international assistance. The concept of a Humanitarian Coordination Center, staffed by representatives of foreign military and civilian agencies but linked to the National EOC, was discussed exhaustively. Contact: vanalphd@paho.cpc.org. □

Andean Region Web Workshop

During the week of 17 April, PAHO held a workshop in Ecuador on the importance of the Internet and in particular, websites, for disaster institutions such as the Red Cross, health departments, Civil Defense and NGOs. The workshop facilitated inter-institutional communication and exchange of information, particularly in identifying institutions with webpages and those that required assistance in their web development. This pilot workshop will be the beginning of a series of workshops involving Andean countries on topics ranging from basic Internet skills training to programming and web development issues. For further information contact sbootsma@ecu.ops-oms.org. □

SUMA Integrated into Regional Disaster Mechanisms

The Humanitarian Supply Management System (SUMA), now widely used and accepted in Latin America, is increasingly becoming integrated into the disaster response mechanisms of the countries in the Region. Here, and in other parts of the world, its utility as a supply management tool and as an indicator of transparency and accountability is increasing.

- In Costa Rica, the Water and Sewage Authority (ICAA) is evaluating the potential use of SUMA in warehouses during disasters, as well as for routine operations, due to its quick installation and low training requirements.
- The Red Cross in Costa Rica, in conjunction with FUNDESUMA, is organizing a workshop to evaluate the SUMA Instructor Manuals
- A SUMA Module will be given as part of the Disaster Prevention and Management Course at the Technical University of Pereira, Colombia, and the local Municipality of Pereira will conduct an evaluation of incorporating SUMA into the local emergency response mechanism.
- SUMA will host a seminar on Humanitarian

Supply Management at the World Association for Disaster and Emergency Medicine in Mexico at the end of May.

For further information on SUMA, please visit www.disaster.info.desastres.net/SUMA/ or e-mail: funsuma@sol.racsa.co.cr. □

The New 'Electronic' CRID

The Regional Disaster Information Center (CRID) has just undergone a makeover as it continues to grow on the Internet. In response to user requests, CRID's newly designed web site features an easier-to-navigate interface for locating critical disaster information and accessing other services more quickly. The new site, which is compatible with all Internet browsers, features the following sections:



compatible with all Internet browsers, features the following sections:

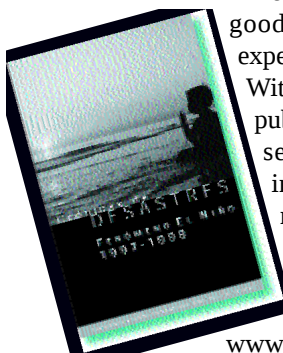
- Home page. Here, CRID will announce news and services and provide the gateway for searching the *Desastres* database and the Virtual Disaster Library (more than 250 full-text documents, as described in the previous issue of this newsletter). The home page also has links to the web sites of CRID's partners.
- A description of CRID, offering a brief history of the Center and its functions, as well as basic information on how to request services.
- Information tools. Describes the databases, information sources and the disaster thesaurus that CRID is using.
- Training material. Offers basic concepts of vulnerability, hazards and risk, guidelines on what to do in different types of disasters and manuals on a variety of topics, including how to establish a disaster information center.
- Latin America and the Caribbean. Basic data on the region and a list of institutions active in disasters in each country.
- Regional Disaster Information System. Updates on the status of the System, agreements that have signed and progress made in a standardized thesaurus, all which is being coordinated by CRID.
- Related sites. Pointers to other sites that deal with disasters. □

Visit the CRID at www.crid.or.cr, or at its mirror site www.crid.desastres.net.



Review of Publications

New Disaster Chronicle on El Niño

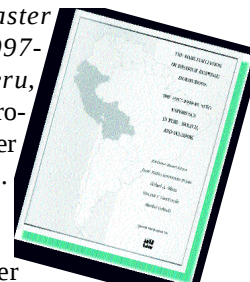


Now that we are between El Niños, this is a good opportunity to collect and learn from the experiences of the last phenomenon in 1997-98. With just that purpose in mind, PAHO/WHO has published a new book in its Disaster Chronicles series that looks back, both technically and institutionally, at the health sector's involvement in this disaster to help avoid repeating the mistakes of the past.

This publication is available in Spanish only. It will soon be on our web site at www.paho.org/english/ped/pedsren.htm.

A Different Approach to El Niño

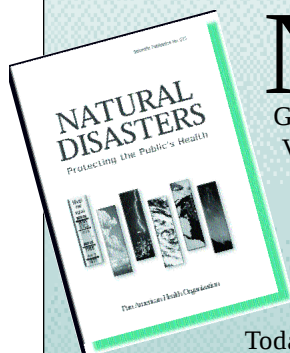
The Marginalization of Disaster Response Institutions: The 1997-1998 El Niño Experience in Peru, Bolivia and Ecuador has been produced by a group of experts, under the coordination of Richard S. Olson, and published by the Natural Hazards Research and Applications Information Center at the University of Colorado, USA.



This publication goes beyond examining the lessons learned from the El Niño to include those not learned. It focuses on the most recent consequences of El Niño (ENSO) and the governmental-institutional response in Peru, Bolivia and Ecuador. It also evaluates institutional preparedness for the next ENSO. One of the study's conclusions is that "official" civil defense organizations in the affected countries were rapidly pushed aside, or marginalized, by new governmental organizations that were temporarily created to manage the response. The study also analyzes how 1997-98 ENSO became an important topic for the media and for each country's policy matters. This document is available in full text on the CRID web site (see page 8). Click on "News." □

Natural Disasters: Protecting the Public's Health

Helping to reducing the impact of disasters where it most counts



Natural disasters remain a very real threat to the health and well-being of the population of the Americas. We need only to recall Hurricanes Georges and Mitch, or the December 1999 flooding in Venezuela. This new PAHO publication is intended to help reduce the consequences of disasters on health.

The first edition of this book was published in 1981 for staff in charge of providing health services after natural disasters. Back then, few questioned who was in charge of preparedness and mitigation.

Today, things have changed, and fortunately society's interest and participation both precedes and extends beyond the actual disaster response phase. Today there is a much greater recognition of the interdependence between disasters and development: on the one hand that disasters set back development, and on the other hand, that the road to development can increase vulnerability and the destructive consequences of natural phenomena.

This new book reflects this perspective and describes, in general terms, what the health sector can do to reduce the impact of disasters on the health of their population.

For the most part, this publication is directed toward health sector professionals involved in disaster preparedness, response or mitigation. However, with today's intersectoral focus on disaster reduction, it also provides a basic framework for all disaster professionals interested in health issues. Public health professors and students may find the publication useful as a basic manual.

To order a copy, send a fax: (301) 206-9789 or e-mail: paho@pmds.com, or to request more information visit PAHO's Library on the Internet at: <http://publications.paho.org>.

New Publication on Health and Environment



La Salud y el Ambiente en el Desarrollo Sostenible is an up-to-date assessment of the impact of environmental hazards on health at local, national, and global levels. Health and environment trends are analysed from the 1970s onward and also used as the basis for projections. Additionally, by describing how a sound environment can support or "enable" health, *La Salud y el Ambiente* demonstrates that environmental quality is crucial to human well-being. Finally, the report demonstrates how integrated health and environment policies and actions are making significant contributions to sustainable development efforts.

To order a copy, send a fax: (301) 206-9789 or e-mail: paho@pmds.com, or to request more information visit PAHO's Library on the Internet at: <http://publications.paho.org>.

Why identify disaster victims?

(from page 1)

The disposal of dead human bodies obeys a variety of sacred religious principles and traditions: immediate burial before sunset for Muslims; burial after one night of mourning in the Jewish religion; and burial after three days for the Catholic and Orthodox faiths. This array of customs—across cultures and religions—confirms that respect for the dead is both universal and indivisible.

In that sense, it is appropriate that the identification and proper disposal of a dead body be linked to international human rights instruments, as human rights are by nature universal and indivisible across cultures, traditions, and customs. Whether there needs to be a legal international instrument that spells out this obligation is certainly an important part of this discussion.

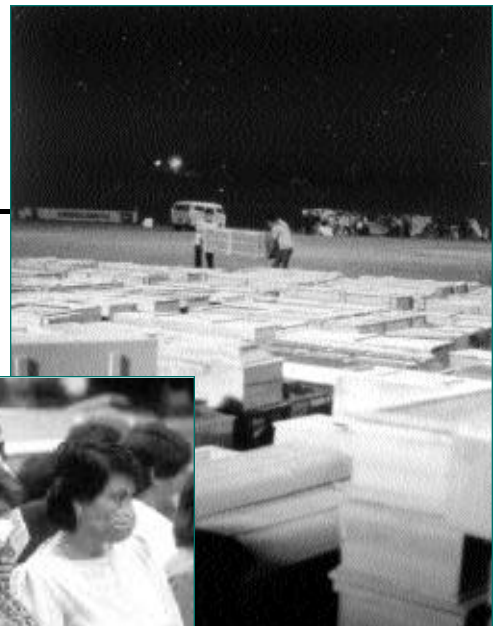
Currently, none of the basic international human rights documents, beginning with the International Bill of Rights has any direct reference to an obligation for appropriate identification and disposal of dead bodies.

It is worth noting, however that, the U.N.'s "Guiding Principles on Internal Displacement" took more care to spell out recommended treatment of the dead. These guidelines, though not legally binding, include reference to, inter-alia: the relatives' right to know the fate of missing; the duty to investigate and to inform next of kin on the progress of the investigation; the need to collect, identify and prevent degradation of corpus to allow for next of kin to respectfully dispose of remains; and to protect grave sites of internally displaced persons.

While the "Guidelines" are encouraging, none of the older international human rights treaties reflect a codification of this more advanced understanding of the importance to family members and the community at large of a dignified and proper disposal of the remains of dead. Steps need to be taken to make sure that jurisprudence, interpretation of treaties and international customary laws properly support decision-makers in humanitarian crises. It is worth noting that further legal analysis of human rights instruments could also help clarify that, so long as there is no real public health concern, the failure of governments to properly account for the dead in disaster situations is inconsistent with many basic obligations under customary and conventional human rights law.

During the days which followed the devastating

August 1999 earthquake in Turkey, the press gave rise to speculations by warning



"explosive epidemics of dangerous communicable diseases were imminent due to the presence of cadavers in the affected areas." This was enough to trigger a campaign of mass burial, depriving thousands of families of their right to know something about their missing relatives.

The press, public health professionals and decision-makers in the public sector each bear some responsibility for this unnecessary blow to human dignity and individual and collective human rights.

It is urgent to stop propagating disaster myths and obtain global consensus on the fact that appropriate management of dead bodies following natural disasters is a matter of collective mental well-being, a question of ethics and human dignity, and rarely a means of avoiding diseases.

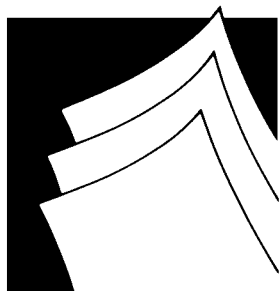
It is the responsibility of international organizations—health and non-health—to put this issue on their human rights agenda and create the forum for such discussions regionally and globally.

Although the Universal Declaration of Human Rights, the guiding document of human rights principles, is silent on the issue of identification and appropriate disposal of the dead, the same document is entirely framed under the inalienable principle of human dignity and therefore cannot be ignored in making this claim. □

PAHO/WHO acknowledges the contribution of Dr. Michel Thieren, WHO/EHA and Mr. Robert Guitteau, Executive Director, Center for Human Rights, American University.

This editorial is an abstract of their collaborative effort (full text available on request from the Editor).

Relatives of those missing in the 1985 earthquake in Mexico anxiously wait to hear something about the fate of loved ones. Meanwhile, the city's baseball stadium served as a makeshift morgue. Proper identification of the dead is more than a legal need, it is a human need.



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.

- A.4** Slowing Umaña, Karin, "Impacto de los desastres naturales en el desarrollo urbano y la salud pública en Centro América y el Caribe, salud y proceso de urbanización en la ciudad de Guatemala," Instituto Centro Americano de la Salud.
- A.5** Chaves Quintana, Pablo, "La integración y preparación de la medicina veterinaria para actuar en situaciones de desastres naturales," paper presented at the XVI Pan American Congress of Veterinary Sciences, 9-13 November 1998.
- A.6** Quarantelli, E.L., "Disaster related social behavior: Summary of 50 years of research findings," University of Delaware, Disaster Research Center, Preliminary Paper #280, 1999.
- A.7** Chaverri Soto, Milton et al., "Alojamientos temporales Municipio de Calarca - Quindio, Colombia," Pan American Health Organization, June, 1999.
- A.8** Noel, Gloria E., "The role of women in health-related aspects of emergency management: A Caribbean perspective", *The Gendered Terrain of Disaster: Through Women's Eyes*, Westport, Conn., pp. 213-223.
- A.9** Baxter, Peter et al., "Difusión: Actividades," *Revista Prevención*, No. 18, May-Aug. 1997.

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Safer Hospitals

No. 1

A Supplement to *Disasters: Preparedness and Mitigation in the Americas*
the quarterly newsletter of PAHO/WHO

April 2000

Disaster Mitigation Goals in the Americas: More Important than Ever



Much has been written about the importance of incorporating disaster mitigation measures into the design, construction and maintenance of our most critical facilities, such as hospitals. Nonetheless, despite the reminder left by extremely severe disasters in recent years, much remains to be accomplished if these facilities are to be fully operational in the aftermath of emergencies.

With just one year left before the deadline set at the International Conference on Mitigation of Natural Disasters in Health Care Facilities, held in Mexico in 1996, meeting national goals is more important than ever.

The disasters throughout the Hemisphere in recent years—among them hurricanes Georges and Mitch and the floods in Venezuela, emphasized the vulnerability of health facilities and how necessary mitigation measures are to keep them operating when disaster strikes.

Specifically, at the International Conference in Mexico, 500 experts outlined a series of recommendations for the period 1996-2001 to improve or initiate efforts to promote disaster mitigation in health facilities in countries at risk of hurricanes and earthquakes. Today, it would be necessary to add floods and landslides to the list of hazards.

One of the key recommendations was that each country identify its highest priority health facilities to conduct vulnerability

studies and adopt the necessary mitigation measures. Another important recommendation, in fact, was to conduct structural vulnerability studies and draw up plans to reinforce priority facilities, employing suitable procedures consistent with current technical know-how.

Another key recommendation was to consider geological and meteorological threats, such as floods and landslides, when planning health services and to include mitigation measures in the design and construction of new health facilities or the remodeling and expansion of existing ones.

Some countries have made progress toward meeting these and other goals, as seen in the examples that are included in this special supplement on the work under way in Colombia, Argentina, Chile, and the Caribbean. However, many tasks are still pending, and the work on disaster mitigation in Latin American health facilities is just beginning, although some concrete results are already visible.

Colombia Readies Hospitals Against Seismic Risk

Santafe de Bogota has Invested in Vulnerability Studies and Reinforcement of Public Hospitals

The Secretariat of Health of Bogotá has invested almost US\$500,000 over the past three years in a vulnerability assessment of 16 public hospitals in the Colombian capital. The funds for this operation have been drawn from city resources, given the importance of guaranteeing that health facilities continue to provide services when disasters strike.

With the vulnerability study almost complete, retrofitting has begun on the Kennedy Hospital, one of the larger, more complex facilities. Work on four more facilities of lower complexity will follow. Approximately US\$ 4.5 million has been invested in the Kennedy Hospital, and close to US\$ 200,000 earmarked for the four remaining hospitals. The studies and retrofitting activities, constitute an investment of more than US\$ 5 million.

To date, Bogotá's public hospital system has nearly 1,900 beds, 58% of them in third-level (high-complexity) facilities,

27% in second-level (intermediate-complexity) facilities, and the remaining 15% in first-level (low-complexity) facilities.

The vulnerability studies and retrofitting designs for second- and third-level hospitals have already been completed, covering almost 83% of hospital beds.

In addition, assessments of the nonstructural and functional vulnerability of third-level hospitals have already begun. This will help to further mitigate the risk faced by Colombian health facilities in natural disasters.

Bogotá faces an intermediate seismic risk and, in 1997 new legislation was passed that increased the mitigation requirements for facilities that, like hospitals, must remain open when a disaster strikes.

Public Hospitals Assessed in Bogotá

Level of Complexity	Hospital	Date of the Assessment
III	Kennedy	1996
	Simón Bolívar	Dec. 97
	Tunal	Dec. 97
	La Victoria	Dec. 97
	Santa Clara	Dec. 98
II	St. Blas	Dec. 97
	Meissen	Dec. 98
	Carmen	Dec. 98
	Fontibón	Dec. 98
	Guavío	Dec. 98
	Granja	Dec. 98
	Bosa	Dec. 98
I	Olaya	Feb. 99
	Tunjuelito	Feb. 99
	Usme	Feb. 99
	Chapinero	Feb. 99

For more information contact Dr. Carlos Roberto Garzón Becerra, Fax: (57-1) 348-0097; e-mail: aemurdes@colomsat.net.co.

Caribbean Hospital Doubly Affected by Hurricanes Rebuilt

90% of St. Kitts Hospital Damaged by Hurricane Georges

In the past decade, two major hurricanes have caused severe damage to the Joseph N. France General Hospital: Luis in 1995 and Georges in 1998. Georges, a category III storm, struck Saint Kitts and Nevis with winds of more than 115 km/hr.

In the aftermath, 90% of the J.N. France Hospital suffered major damage and was out of commission. The majority of the structure had no roof, and even though all the windows had been boarded up as protection against the winds, the impact was critical. Even the roofing installed after Hurricane Luis was lost.

In a few hours Georges had virtually destroyed the only referral hospital on the island of St. Kitts, which served a population of 33,000. Given the urgent need to rehabilitate the hospital, PAHO launched a rehabilitation project, with financial support from the European Community Humanitarian Office (ECHO), the United Kingdom's Department for International Development, and the Government of the Netherlands. The assistance enabled the government to rebuild critically damaged areas and departments. By September 1999 the reconstruction

was successfully completed, and what was once a vulnerable hospital, today is a structure with the highest standards of resistance to hurricanes and earthquakes.

Other Caribbean Islands

In addition, under a second ECHO project, vulnerability studies of hospitals are being conducted on other Caribbean islands to reinforce selected buildings. A study of this type is currently underway in Saint Lucia and Grenada and will end in June of this year with two workshops on mitigation to disseminate the guidelines prepared by the ECHO project.

Based on this experience, a technical document, "Mitigation of Natural Disasters in Health Facilities—Guidelines for Vulnerability Analysis," will be prepared by professionals based on the experiences of the Caribbean countries and geared to hospital administrators and other health professionals in the Caribbean. These guidelines will indicate how to conduct preliminary assessments of vulnerability to earthquakes and hurricanes in the respective departments. They will also provide professionals with tools for their negotiations with technical staff and for setting priorities in the rehabilitation of their units.

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Health Network Collapses in Worst Affected Areas of Venezuela

The worst disaster in Venezuelan history struck last December, sparing very little in its path. The Maternal and Child Hospital of Macuto was partially buried under the rocks and mud swept down by landslides from the Cerro Avila on Venezuela's central coast following torrential rains.

However, this children's hospital was only one of the 43 health facilities that were left out of commission in the State of Vargas, where the most damage occurred, revealing the vulnerability of these facilities to disasters and the importance of preparing in every possible way to lessen this vulnerability.

Some health centers were irreparably damaged, totally buried by the avalanche; others suffered serious damage, and the remainder, a degree of damage that also kept them out of commission for several hours, days, or even weeks. In some health facilities, the infrastructure was not damaged, but they were unable to operate because basic services such as water and electricity were interrupted, or because access to the facility was blocked. This heightened the impact of the disaster, leaving the injured and other survivors without a health center to provide immediate attention.

Six outpatient facilities (out of a total of 36) and the Maternal and Child Hospital were either totally or partially buried by the

mud, requiring relocation and reconstruction. Three more hospitals suffered major damage and require very costly repairs, while the 32 remaining facilities also suffered minor damages (see box).

Damaged Health Facilities Vargas, Venezuela

DESTROYED. MUST BE RELOCATED OR REBUILT

- Six outpatient facilities
- One maternal and child hospital (will become general hospital)
- One psychiatric hospital

SEVERE DAMAGE. REQUIRES MAJOR REPAIRS

- One type 3 hospital*
- Two type 2 hospitals

REQUIRE MINOR REPAIRS

- 30 type 1 outpatient facilities
- One Childrens and Adolescents Hospital
- One Geriatric facility

* The level of complexity of health facilities in Venezuela is classified from Type 4 (most complex) to Type 1 (least complex).

Source: Ministry of Health and Social Development

The magnitude of the damage was such that, according to Venezuela's Ministry of Health and Social Development, rehabilitating the entire network of health facilities in the State of Vargas alone will cost nearly US\$ 44 million. Of this investment, 64% will go to replacing buildings and the remaining 35% to equipment and the development of a modern transportation and communications network.

Almost half the total investment will be for new infrastructure—for example, the construction of a 120-bed hospital to replace the Maternal and

Child Hospital of Macuto, 45 comprehensive care units, which serve as the population's point of entry to the new model of care; six urban outpatient facilities; and a regional psychiatric hospital with 200 beds. This investment represents an opportunity to reduce the vulnerability not only of health facilities but of the entire health services network of the State of Vargas.

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Safe Hospitals throughout Chile

Sustained Effort to Mitigate Hospital Vulnerability to Earthquakes and Fire

From Arica at the northern tip of the country to Puerto Montt in the South, the Chilean Ministry of Health has identified hospital buildings most vulnerable to earthquakes and/or fires.

The assessments, which began seven years ago, determined the vulnerability of 14 hospitals and disaster mitigation measures were defined. The studies revealed that the hospitals' weak points are related to both structural and nonstructural factors. These weak points were uncovered, for example, in the case of the Coquimbo Hospital, when the pillars and beams of its lower floors were damaged in an earthquake in 1997. After the respective vulnerability study, the structure was reinforced by constructing 33 new walls to minimize the impact of an earthquake on the building. An important point is that constructing these walls is part of a series of expansions programmed as part of the normalization of the hospital, demonstrating that not only is it feasible and highly profitable to include mitigation measures when expanding health facilities, it is also a good solution.

Models and Standards, a Good Outcome

Chile's mitigation efforts will continue in 2000 and 2001 with a series of studies to develop an "Analytical Model for the will include a study of structural and nonstructural aspects of hospitals, ranging from the local geology to topography, soil mechanics, and microvibration of the structures.

Plans are also afoot to set standards for the design of new hospitals, permitting them to withstand earthquakes and remain operational. Meanwhile, in the buildings currently planned, a series of new requirements have been introduced to make structures more earthquake-resistant.

Other important actions include the creation of a laboratory to determine the seismic vulnerability of medical equipment, and the recent publication of the "Manual on Fire Prevention in Health Facilities" that will be soon be posted on the Ministry of Health website (www.minsal.cl).

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(cont. on page S-4)

Argentina Also Evaluates the Vulnerability of Hospitals in San Juan Province

Public Health Centers Located in High Seismic Risk Areas

Western Argentina is a seismically active region with several provinces: San Juan, Mendoza, Salta, and Jujuy. This area has been hit by destructive earthquakes for the past 300 years, and San Juan and Mendoza were the sites of real regional disasters after the earthquakes of 1944 and 1961, respectively.

Nine of the 13 health centers and public hospitals of San Juan are located in Area 4 (very high seismic risk), and the four remaining centers in Area 3 (high risk). Together, these centers have 1,157 beds serving almost 600,000 inhabitants.

For this reason the National University of San Juan decided to launch a research project known as "Preliminary Assessment and Reduction of Seismic Vulnerability in the Public Hospital Network of San Juan Province," scheduled for 2000 and 2001 and sponsored by the School of Architecture, Urban Planning, and Design.

The project is subsidized by the University, but also has the endorsement and patronage of the Health Program for Disaster Prevention of the Secretariat of State and Public Health of San Juan, as well as technical support from PAHO/WHO.

The study will include a structural, nonstructural, and functional assessment of the health centers that will permit the design of measures to reduce its seismic vulnerability. This will be a very complete study with four interrelated phases.

The first phase involves the collection and systematization of background information on the damage that earthquakes produce in hospitals, an estimate of the seismic risk in San Juan and at the sites where its health centers are located, the damage produced by historical earthquakes in the hospitals of San Juan and neighboring areas, and soil characteristics in the area in which each hospital is located.

The second phase will consist of the compilation and reconstruction of the information needed for the assessment (from technical documentation to photographs), and the third, of a preliminary vulnerability assessment of each hospital, which implies the classification and prioritization of each in terms of the estimated level of risk, the complexity of the hospital, and the population served.

The study will conclude with a fourth assessment phase and a list of the necessary mitigation activities for each hospital to orient actions in the short, medium, and long term.

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Excellence in Disaster Mitigation

The PAHO/WHO Collaborating Center on Disaster Mitigation in Health Facilities created just two years ago and located in the University of Chile's School of Physical and Mathematical Sciences has already provided important technical assistance in Argentina, Bolivia, Chile, Ecuador, Peru, and even Nepal, in Asia.

The Center has devoted itself to providing assistance in areas such as vulnerability assessment, the design of mitigation strategies, the rehabilitation of hospitals and health systems, training and the development of instructional and technical materials.

This effort brings together and coordinates professionals and technical personnel from other institutions and countries and currently employs the expertise of specialists in the assessment of seismic, hydrologic, and meteorological risk. One of the special features of the Center is precisely that it is an open institution that invites professionals with demonstrable experience to participate.

Experience in the Field

The Collaborating Center on Disaster Mitigation in Health Facilities has provided emergency technical assistance in identifying and quantifying damages and defining strategies for rehabilitation in the hospitals of Bahía Caraquez in Ecuador, Aiquile in Bolivia, and Region Four in Chile. It has also con-

ducted vulnerability studies in Chile in the Coquimbo and Copiapó hospitals.

Reviewing national risk reduction programs in existing structures and designing strategies for new systems has been another aspect of the Center's advisory services. Work in this area has been done in Argentina, Chile, Ecuador, Peru, and Nepal.

How to Assess the Vulnerability of a Hospital

One valuable contribution of the PAHO/WHO Collaborating Center will be a document, "Methodology for Hospital Vulnerability Assessment", detailing the theory behind the methodology and its application.

The document will be accompanied by the specific example of Hospital of Arica, located in northern Chile, a region hit by several earthquakes of a magnitude higher than 7.5 on the Richter scale and two tidal waves in the past century. The hospital that was assessed had been damaged by a 6.7 magnitude earthquake and had already been repaired. The document details the steps of the vulnerability assessment, from the objectives and background to the expected results, the duration of the activities, and the professionals required. The publication will be ready by mid-year.

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