

HURRICANE KEITH

HEALTH RAPID ASSESSMENT REPORT

MINISTRY OF HEALTH
IN COLLABORATION WITH
THE PAN AMERICAN HEALTH ORGANIZATION/
WORLD HEALTH ORGANIZATION

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I EXECUTIVE SUMMARY

Hurricane Keith remained wobbling over the islands of San Pedro, Ambergris Caye and Caye Caulker for approximately 72 hours, affecting also the northern part of the Belize, Orange Walk and Corozal Districts, where it downgraded to a tropical storm late October 2, 2000.

Four of the six districts of Belize were seriously affected by Hurricane Keith (Belize District which includes Ambergris Caye and Caye Caulker), Orange Walk, Corozal and the Cayo Districts). Approximately 72,092 persons (30% of the total population-- based on the Census 2000) have been directly affected and will be at risk of health impairments due to Hurricane Keith.

During the hurricane **there were two confirmed deaths and two persons were reported missing** in the island of Ambergris Caye. Nine days after, the National Health Information/Surveillance Unit reports that at least 808 people have sought medical attention for injuries (142), vomiting and/or diarrhea (118), fever and cough (153), skin infections (30) and food poisoning (2). These figures are very conservative since the regular reporting mechanisms are compromised due to the emergency situation.

Keith left at least 3,279 homeless in Ambergris Caye and Caye Caulker, and at least 13,460 persons are isolated in the rural areas of the Belize, Orange Walk and Corozal Districts. In addition to the homeless in the cayes at least 12,649 persons suffered direct damage to housing and properties in the flooded areas. Approximately 55,182 remain in flooded areas and the water continues to rise in some areas of the country.

Main Areas of Concern

The population living in flooded areas will be at high risk of being affected by possible outbreaks of diseases, particularly dengue fever, malaria, hepatitis A, cholera, leptospirosis, and gastroenteritis. However, this can be prevented with the intensification of existing public health programmes, particularly vector control, water quality monitoring and treatment, public health education and epidemiological surveillance.

To date there is no evidence of any outbreak situation in the country.

Safe drinking water is a critical issue. Water supply systems were greatly affected by Hurricane Keith. The islands and four districts were completely flooded, washing dumpsites, sewer, lagoons and excreta from latrines and septic tanks into residential areas. This also caused contamination of wells used by the residents for drinking purposes.

Even though the cayes are the areas with major infrastructural damage, **from the public health point of view, the cayes are not at high risk of outbreaks, and the biggest challenge remains inland due to the extensive flooding and isolation of rural communities.**

Nutritional status of the population living in affected areas, particularly those flooded areas where livestock and crops for domestic consumption were destroyed, is a major area of concern.

The impact of Hurricane Keith in the mental health of the affected population is yet to be determined. The socioeconomic conditions will be of particular importance in this respect as people move from “survival” to “normal” modes of functioning.

Public Health Programmes have been affected due to deployment of personnel to attend the emergency situation. Lack of appropriate equipment and supplies in some areas is of concern.

Primary Care services are constrained due to the deployment of medical and nursing personnel to the isolated communities.

Ministry of Health Response

Ministry of Health activated its Hurricane Plan on Friday, September 29th at 2:00 p.m. The Ministry of Health Emergency Command Center was established in Belize City on Friday, under the direction of the Permanent Secretary, and moved to Belmopan on Saturday 30th September at 10:00 p.m.

The Ministry of Health established an Assessment Team, which initiated field visits on October 4. As of October 10, seventy-one (71) communities have been visited by health teams. Ten health teams comprised of a medical doctor, a public health nurse, a public health inspector and a vector control officer visited affected communities to provide essential health services and to complete needs assessment.

Management and distribution of donated medical supplies are totally integrated in the SUMA system, which was established on Thursday, October 5.

The MOH prepared a preliminary report on October 3, and launched an appeal for external assistance on Wednesday, October 4. By October 10, several donors have confirmed their contribution through the Pan-American Health Organization as follows: **OFDA**, US\$232,000; **DFID**, US\$150,000; and **CIDA**, CAN\$ 50,000 (US\$33,333), for a total of **US\$415,333**.

The Ministry of Health received the solidarity support of **the Government of the Bahamas** (donation of medication and deployment of a Health Team for the provision of medical services to affected communities); **the Government of Mexico** (donation of medication); and **the General Consul of the Assembly of God** (deployment of a Health Team for the provision of medical services to the affected population).

The Ministry of Health has also completed its emergency operational action plan for the next two months and is now implementing the same.

Recommendations

Establish post disaster epidemiological surveillance in affected communities for early detection of outbreaks, and develop contingency outbreak control plans. Intensify and restore regular epidemiological surveillance system as soon as possible.

Immediate restoration and intensification of public health programmes, particularly monitoring water quality, food inspection, and vector control.

Address environmental conditions in affected areas.

Conduct intensive public awareness campaigns on post disaster health issues and training at community level.

Replace damaged equipment and supplies in health facilities affected.

Immediate restoration of the equipment and supplies for the Central Medical Laboratory and the Blood Bank, particularly those concerning with blood screening and testing for laboratory confirmation of communicable diseases under surveillance in the post disaster phase.

Intensify and maintain mobile services to those communities isolated due to the flooding.

Implementation of an aggressive emergency Vector Control strategy.

Intensify nutrition surveillance and micro-nutrient programme in affected areas.

Monitor closely the mental health of the affected population, and ensure provision of post-traumatic counseling services, specifically related to violence, drug abuse and depression.

Increase disaster response capacity at national level based upon the lessons learned from Hurricane Keith (update contingency plans).

II INTRODUCTION

Tropical depression No. 15 became a tropical storm (Keith) on September 29, 2000 at 3:00 p.m. approximately 270 miles from the coast of Belize. On September 30th, 8:00 a.m. Keith became a category I Hurricane with sustained winds of 80 mph moving slowly in a W NW direction. By 11:00 p.m. Keith had upgraded to a category III Hurricane with sustained winds of 120 mph and became stationary, strengthening overnight to a category IV at 6:00 a.m. October 1 at about 55 miles away from Corozal Town (18.0 N and 87.3 W).

Hurricane Keith remained wobbling over the islands of San Pedro and Caye Caulker for approximately 72 hours, affecting also the northern part of the Belize, Orange Walk and Corozal Districts, where it downgraded to tropical storm on late October 2.

From September 30 to October 3, 2000 over 26 inches of rainfall were reported in the country of Belize, with 18 inches in the last 24 hours. Surges of 1-2 feet were experienced in the Coastal areas of Belize and Corozal District as Keith moved in a west direction to the State of Campeche in Mexico.

The Ministry of Health (MOH) activated its Hurricane Plan on Friday, September 29, 2000 at 2:00 p.m.

The National Emergency Management Organization (NEMO) was activated on September 30, 2000 at 10:00 a.m.



The Ministry of Health activated its Hurricane Plan on Friday, September 29 at 2:00 p.m. The Ministry of Health Emergency Command Center was established in Belize City on Friday, under the direction of the Permanent Secretary, and relocated to Belmopan on Saturday September 30 at 10:00 p.m. State of National Emergency was declared by the Prime Minister of Belize on Monday, October 2 at 2:00 p.m.

III OBJECTIVES OF RAPID ASSESSMENT:

1. To provide MOH with information on the impact of Hurricane Keith on the Health Situation of the population to guide the decision making process in the post hurricane phase.
2. To recommend actions to prevent and/or control potential outbreaks.
3. To identify areas in need of assistance.

IV METHODOLOGY

The Ministry of Health established an MOH/PAHO Keith Health Assessment/Surveillance Team on October 3 (Annex 1). The PAHO Caribbean Program Coordination (CPC) Disaster and Health Services Advisors joined the team immediately after. The Assessment Team compiled data reported from the different districts on a daily basis, both in standard and non-standard formats.

The assessment was conducted following the PAHO/WHO Disaster Response Team guidelines and assessment forms (See annex II). The Initial Damage Assessment Form incorporates the UN Recommendations. An Environmental Health Assessment form was developed to expand on these issues. In addition to direct observation, interviews to key informants were conducted.

On October 4, the Assessment Team visited the islands of Caye Caulker and San Pedro and flew over Orange Walk, Belize District and part of the Cayo District.



MOH/PAHO, Rapid Assessment Team going to Caye Caulker and Ambergris Caye, headed by Mr. Henry Anderson, Permanent Secretary, Ministry of Health, Oct. 4, 2000

On October 4, 5 and 6 various health teams visited the affected communities (Annex III), to complete the assessment and provide limited public health and clinical services to the affected population.

A post disaster surveillance protocol was developed and forms distributed to shelters and health centers for the collection of information on health status and injuries (Annex IV). Even though, regular surveillance could not be established for shelters, data reporting occurred in various levels and information was analyzed and utilized on a day to day basis. Information was used to

support the decision making process of the Ministry of Health in relation to the relief and mitigation phase, and to guide the request for external assistance.

Areas Assessed

Population and Health conditions (including Mental Health)

Facilities and Utilities

Environmental Health

Food safety

Critical Equipment/Supplies

Health Facilities and Services

V RESULTS:

Population and Health Conditions:

Four of the six districts of Belize were seriously affected by Hurricane Keith, Belize District (which includes Ambergris Caye and Caye Caulker), Orange Walk, Corozal and the Cayo Districts. According to report No. 1 of the National Population and Housing Census 2000, the total population living in these districts is 192,359. Approximately 72,092 persons (30% of the total population) have been directly affected and will be at high risk of health impairments due to Hurricane Keith in Belize.



Trying to clean up the damage, October 3, 2000



Making their way out to the flooded Corozal/Belize Highway, October 3, 2000

During the hurricane **there were two confirmed deaths and two persons were reported missing** in the island of Ambergris Caye. Four deaths occurred as a result of a road traffic accident in the Northern High Way on October 3, day when the all clear phase was declared. In the accident 31 people resulted with minor injuries and 5 in critical stage. Nine days after, the National Health Information/surveillance unit reports that at least 808 people have sought medical attention for injuries (142), vomiting and/or diarrhea (118), fever (177), fever and cough (153), skin infections (30) and food poisoning (2) (see annex IV). These figures are very conservative since the regular reporting mechanisms are compromised due to the emergency situation.

**ESTIMATED AFFECTED POPULATION IN ASSESSED AREAS
COUNTRY OF BELIZE**

Location	Total Population As Per Census 2000	Total Population As Per PH1 Or Key Informant	Homeless	Injured	Displaced	Living In Flooded Areas	Living in Flooded Houses	Isolated (No access by road)	At high risk of health impairment
Belize	62,729	20,715	3,279	94	3,279	23,873	4,863	4,555	35,314
Orange Walk	26,344	18,297		16	4,022	9,929	2,732	7,509	15,536
Corozal	26,965	25,366		20		15,358	610	1,396	15,419
Cayo	9,814	3,107		12		6,022	1,165		5,823
TOTAL	125,852	67,485	3,279	142	7,301	55,182	12,649	13,460	72,092

Keith left at least 3,279 homeless persons in Ambergris Caye and Caye Caulker, and at least 13,460 persons are isolated in the rural areas of the Belize, Orange Walk and Corozal Districts. In addition to the homeless persons in the Cayes, at least 12,649 persons suffered direct damage to housing and properties in the flooded areas. Approximately 55,182 remain in flooded areas and the water continues to rise in some areas of the country.



Roaring Creek, junction to Belmopan, Oct. 2, 2000



Crooked Tree Bridge, 14 -16 feet of water, October 6, 2000

According to the Belize Weather Bureau, it will take approximately four months for the water to recede from the flooded areas. As a result of the flooding, the destruction and contamination of water sources, the poor environmental conditions and poor personal hygiene, at least 72,092 persons are at high risk of health impairments.



Having fun in contaminated water, Crooked Tree Village, Oct. 6, 2000



Water tank, May Pen Village, Oct. 7, 2000

Due to the existing epidemiological situation compounded by the environmental conditions and the disruption of the public health and primary care services, the potential for outbreaks is high. Particularly water, food and vector borne diseases such as: **dengue fever, typhoid, malaria, cholera, gastroenteritis, leptospirosis, and hepatitis A.**

To date, there is no evidence of any outbreak situation in the country. Even though there was extensive damage to the islands, from the health point of view, the biggest problem remain inland, where approximately 55,182 persons are now living in flooded areas with limited communication and access to services, particularly health services.



Unloading medical supplies at Burrel Boom Village, Oct. 7, 2000



Roaring Creek Village, October 2, 2000

Even though mental health assessment was not conducted in all the visited areas, a non-standardized assessment was done in the islands of Caye Caulker and Ambergris Caye (See Annex V). In the initial visit the assessment team identified the Caye Caulker population in a very depressive situation. In the islands various levels of reactions to stress were observed. Depression was the most observed mental condition. Some inhabitants, who were having greater difficulties coping with the situation, left the islands, particularly the elderly.

Health personnel perceive that the current stressful situation have put people in a survival mode limiting their ability to fully assess the personal nature of the damage. The socioeconomic conditions will be of utmost importance in this respect as they move from 'survival' to 'normal' modes of functioning. How they will react to the drastically changed circumstances, once the 'crisis' is over is yet to be determined.



Trying to return home with uncertainty, October 3, 2000



Lost everything, but I am alive! San Pedro, October 4, 2000