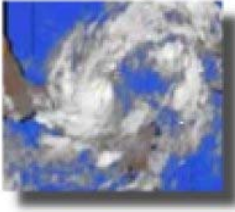


Hurricane Keith, Belize

Report on the Karl Heusner Memorial Hospital, Belize City



The Karl Heusner Memorial Hospital is the national referral hospital in Belize, receiving patients from Belize City and all Districts. It also serves as the Accident and Emergency Center for Belize City and the rest of the country. As such, it is essential that this Hospital is able to function during and immediately after a hurricane.

The Hospital normally provides 24-hour accident and emergency services and inpatient services as follows:

General Medicine	25 beds
General Surgery	25 beds
Pediatrics	25 beds
Obstetrics/Gynecology	25 beds
Accidents and Emergency	10 beds
Special Care Baby Unit	9 beds

Immediately before and during Hurricane Keith, some patients were discharged from the Hospital and some transferred to the District Hospitals in Belmopan and San Ignacio. From a patient count of about 40 early on Saturday, the number fell to a low of around 9 on Sunday, rising again to about 20 by Tuesday afternoon.

The main source of electric power shut down at approximately 2 p.m. on Sunday, and was eventually restored at noon on Tuesday. The Hospital's stand-by generator functioned throughout this period for about 48 continuous hours, although the generator room was flooded to within two inches of the base of the equipment.

Unfortunately the generator did not serve the Central Laboratory and Blood Bank, and this resulted in losses of reagents and blood supplies.

The supply of medical gases and suction was not interrupted and water was available throughout the event pumped from the Hospital's storage tank.

The Hospital therefore remained functional throughout the storm and this is undoubtedly a tribute to the determination and resilience of the staff, as a large amount of water entered the buildings through the roof, windows and doors and also up through the floor. Fortunately no equipment suffered serious damage, although the immediate and longer-term effects of the water seepage on floors and ceilings will undoubtedly be a problem. Much of this damage was from known "chronic" building problems (such as the roof drainage system, leaks around windows and doorframes, etc.) that were exacerbated by the hurricane

Overall Assessment and Recommendations

Hurricane Keith has provided a timely test of the capability of the Karl Heusner Hospital to withstand hurricanes. While not exactly failing this test, the hospital cannot be said have passed. Previous disaster management plans for the institution have included total evacuation, but this event has shown that it can withstand some measure of wind and rain. However there are some important lessons from Keith's exploitation of the weaknesses of the building.

There are signs that the buildings were designed or have subsequently been retrofitted to withstand hurricanes. All the windows are double-glazed (even in areas that are not air-conditioned) and there are rails for wooden shutters, which were originally provided. These shutters have proved difficult and time consuming to put in place, as there are many windows some of which are high or otherwise inaccessible. In addition the shutters have in the past become swollen when wet making them difficult to remove without causing damage. They have also deteriorated during storage.

Defects to the building may have arisen during construction or because of unexpected deterioration of the materials used (e.g. the silicone sealant around the windows).

The roof itself is flat, with a membrane covered with loose large pebbles. In higher winds than those experienced in Keith, these might become missiles and cause significant damage. The generator is tested and maintained regularly and this undoubtedly contributed to its good condition and ability to function for a long period. There are proposals to deal with the flooding of the generator and other heavy plant rooms.

It is essential that the Hospital continue to function on this site during and immediately after a hurricane. Setting up an emergency hospital in a "safe" building in another part of Belize City should be considered as a last resort and only if the Hospital is almost totally destroyed.

The following recommendations are offered

Proposals for future rehabilitation efforts should be reviewed in light of the experience of Hurricane Keith. Proposals themselves should also be reviewed with a view to ensuring that the solutions identified will lead to improved protection of the building itself and the staff and patients occupying it. Special technical assistance should be provided for this review.

A specific vulnerability analysis, including costs, should be conducted on the departments and areas critical to the functioning of the Hospital during and immediately after a hurricane. This should focus on the Accident and Emergency Department; Operating Theatres; Wards (to provide 50 "safe" beds); Maternity; and Pharmacy. The analysis should also focus on the following services: water; electricity; medical gases.

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