Safe Hospitals in the Caribbean

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Jamaica

Pan American Health Organization
World Health Organization REGIONAL OFFICE FOR THE AMERICAS
Mandate

Resolution CD45.R8 from 45th Directing Council:

- Adopt “Hospitals Safe from Disasters”
- Strengthen disaster preparedness and mitigation programmes

What is a Safe Hospital?

“A health facility whose services remain accessible and functioning at maximum capacity and in the same infrastructure, during and immediately following the impact of a natural hazard.”
More than 50% of the nearly 16,000 hospitals in Latin America and the Caribbean are located in areas at high risk of disasters.

Hospitals are a huge investment and represent between 40-60% of the Ministries of Health Budget.

Hundreds of them have been damaged or destroyed as a result of major earthquakes, hurricanes, and floods, causing massive impact in health care and enormous economic loss for the health sector.
Natural Hazards

EARTHQUAKES
- Mexico, 1985
- Peru, 2007
- El Salvador, 2001
- Haiti, Chile, Mexico, 2010

HURRICANES
- Jamaica, H. Gilbert, 1988
- Dominican Republic, H. Georges, 1998
- Grenada, H. Ivan, 2004
- United States, H. Katrina, 2005
- Cuba, H. Gustav & Ike, 2008

OTHER EVENTS
- Colombia - volcanic avalanche, 1985
- Peru & Ecuador - El Niño Phenomenon, 1997
- Argentina - floods, 2003
- Haiti & Dominican Republic - landslides, 2004
- Mexico - floods, 2007
- Mexico, Chile, Argentina - Pandemic H1N1 2009
### Earthquake in Mexico City

<table>
<thead>
<tr>
<th>Location</th>
<th>Event</th>
<th>Year</th>
<th>Nature of Hazard</th>
<th>Overall Effects</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mexico</td>
<td>Earthquake</td>
<td>1985</td>
<td>8.0 magnitude</td>
<td>49 health facilities damaged, including 3 major hospitals (loss of use of 5,829 beds)</td>
</tr>
<tr>
<td>Location</td>
<td>Event</td>
<td>Year</td>
<td>Nature of Hazard</td>
<td>Overall Effects</td>
</tr>
<tr>
<td>------------</td>
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<td>---------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Jamaica</td>
<td>Hurricane Gilbert</td>
<td>1988</td>
<td>Cat. 3</td>
<td>24 hospitals and health centres damaged or destroyed – 5,085 beds lost</td>
</tr>
<tr>
<td>Location</td>
<td>Event</td>
<td>Year</td>
<td>Nature of Hazard</td>
<td>Overall Effects</td>
</tr>
<tr>
<td>-------------------</td>
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<td>----------------------------------------------------</td>
</tr>
<tr>
<td>Dominican Republic</td>
<td>Hurricane George</td>
<td>1998</td>
<td>Cat. 3</td>
<td>87 hospitals and health centres damaged or destroyed</td>
</tr>
<tr>
<td>Location</td>
<td>Event</td>
<td>Year</td>
<td>Nature of Hazard</td>
<td>Overall Effects</td>
</tr>
<tr>
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<td>--------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Haiti</td>
<td>Earthquake</td>
<td>2010</td>
<td>7.0</td>
<td>50 hospitals and health centres damaged or destroyed; economic losses est. US $7.8 billion</td>
</tr>
</tbody>
</table>
Hospital Safety Index

- 145 checklist items: structural, non-structural and functional components
- Rapid, reliable and low-cost diagnostic tool
- Hospitals fall into 3 safety categories: A - high, B - average and C - low
- An important first step toward prioritizing a country’s investments in hospital safety
Structural - Seismic Considerations

Interactions between structural and nonstructural components

![Diagram showing interactions between structural and nonstructural components](image-url)
Seismic Considerations:
Masonry walls interacting with RC frame, causing failure due to short columns
Seismic Considerations:
Building displacements – avoid pounding
Seismic Considerations:
Irregularities on plan and elevation
Seismic Considerations:
Use of seismic joints

(A) Concentration of stresses in structures with complex geometry

Concentration of stresses

(B) Seismic joints recommended for complex floor plans
Seismic Considerations:
Asymmetry due to location of structural elements
Seismic Considerations:
Soft stories

1. Open ground floor
2. Soft story at intermediate level

Image: http://helid.digicollection.org
Seismic Considerations: Base Isolation

Image: http://bridgestone.com
In the Caribbean

4 Courses conducted
Trained 108 professionals
45 hospitals assessed
Hospital Safety Index Application

1. Anguilla
2. Argentina
3. Bahamas
4. Barbados
5. Belize
6. Bolivia
7. British Virgin Islands
8. Colombia
9. Costa Rica
10. Cuba
11. Dominica
12. Dominican Republic
13. Ecuador
14. El Salvador
15. Grenada
16. Guatemala
17. Guyana
18. Honduras
19. Jamaica
20. Mexico
21. Montserrat
22. Panama
23. Paraguay
24. Peru
25. Saint Kitts and Nevis
26. Saint Vincent & the Grenadines
27. Suriname
28. Trinidad and Tobago
29. Uruguay
30. Venezuela
Index Results - Caribbean

- Hospitals assessed: 1 Hospital – Category A
  80% - Category B
  18% - Category C

- Safety improvement: 40% of hospitals assessed

<table>
<thead>
<tr>
<th>Safety Index</th>
<th>Category Type</th>
<th>Safety level</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.66 – 1.0</td>
<td>A</td>
<td>High</td>
</tr>
<tr>
<td>0.36 - 0.65</td>
<td>B</td>
<td>Average</td>
</tr>
<tr>
<td>0.0 - 0.35</td>
<td>C</td>
<td>Low</td>
</tr>
</tbody>
</table>
Index Results - Jamaica

- 10 Hospitals assessed:

<table>
<thead>
<tr>
<th>Hospital</th>
<th>Date</th>
<th>Grade</th>
<th>Category</th>
</tr>
</thead>
<tbody>
<tr>
<td>Annotto Bay</td>
<td>Nov-12</td>
<td>0.23</td>
<td>C</td>
</tr>
<tr>
<td>Black River</td>
<td>Nov-12</td>
<td>0.31</td>
<td>C</td>
</tr>
<tr>
<td>Bustamante</td>
<td>Nov-10</td>
<td>0.61</td>
<td>B</td>
</tr>
<tr>
<td>Cornwall Regional Hospital</td>
<td>Oct-10</td>
<td>0.50</td>
<td>B</td>
</tr>
<tr>
<td>Falmouth</td>
<td>Dec-12</td>
<td>0.34</td>
<td>C</td>
</tr>
<tr>
<td>Mandeville</td>
<td>Dec-12</td>
<td>0.34</td>
<td>C</td>
</tr>
<tr>
<td>Princess Margaret</td>
<td>Nov-12</td>
<td>0.39</td>
<td>B</td>
</tr>
<tr>
<td>Spanish Town</td>
<td>Oct-10</td>
<td>0.45</td>
<td>B</td>
</tr>
<tr>
<td>St. Ann's Bay</td>
<td>Oct-10</td>
<td>0.55</td>
<td>B</td>
</tr>
<tr>
<td>University Hospital of the West Indies</td>
<td>Nov-12</td>
<td>0.44</td>
<td>B</td>
</tr>
</tbody>
</table>
Structural Safety

- 90% of hospitals had some minor deterioration to their facility
- 80% of hospitals have satisfactory structural resilience to various hazards
Non-Structural Safety

POORLY SECURED ITEMS

- 48% poor condition of anchors of heating & hot water equipment
- 62% poor safety of computers and printers
- 52% medical equipment generally not secured
- 57% have not properly anchored shelve contents
Functional Safety

- 81% of hospitals DO NOT have a functioning disaster committee
- 57% of hospitals do not have procedures for evacuating
- 48% emergency routes are inaccessible, poorly labelled or obstructed
On-going work - PAHO

• Safe Hospitals Project - Funded by Dipecho
  – Improve HSI by 5% for 7 Facilities in 6 Countries
  – Establish Safe Hospital Committees in 6 countries
  – Continuous training and awareness initiatives
• Hospital Safety Index for Small Facilities
• Check Consultants initiative
• Fire Safety and Evacuation Guide for Hospitals
• Base Isolation technical training courses
Moving Forward: Issues

- Systematically monitoring progress
- Improve the safety of existing health facilities
- Legislation on the design and construction, and rehabilitation of health facilities
- Strengthen participation from non-health sectors
HOSPITALS SAFE FROM DISASTERS

www.paho.org/disasters
www.disaster-info.net/safehospitals_refdocs/