

Hospital Safety Index



Regional Consultation of
SEAR Member Countries on
Hospitals Safe from Disasters

New Delhi, India ♦ 16 April 2008

Patricia Bittner, PAHO/WHO




World Health Organization
Regional Office for South-East Asia

The Context

The Hyogo Framework for Action 2005-2015 (HFA) included the following measure of commitment to and success of national risk reduction:



Integrate disaster risk reduction planning into the health sector; promote the goal of “hospitals safe from disaster” by ensuring that all new hospitals are built with a level of resilience that strengthens their capacity to remain functional in disaster situations and implement mitigation measures to reinforce existing health facilities, particularly those providing primary health care.



Why focus on safe hospitals?

A social/political issue

- Safe hospitals have symbolic social value; losing a health facility leads to a sense of insecurity and social/political instability.
- They are occupied around-the-clock by the most vulnerable population.
- Disaster-resilient hospitals must be able to protect the lives of patients and staff *and* continue to function.





Why focus on safe hospitals?

A health issue

- Disasters produce an intensive demand for health services. In addition to treating disaster victims, hospitals must quickly resume treatment of everyday emergencies and routine care.
- The hospital network are integral components of a nation's public health system.
- The long-term impact of losing these services is difficult to quantify and therefore may be overlooked.


The loss of public health services is a real setback to achievement of the Millennium Development Goals.



Why focus on safe hospitals?

An economic issue

- Hospitals represent an enormous investment for any country.
- Destruction or loss of functionality pose a major economic burden.
- Direct economic losses involve more than the structure: the cost of non-structural elements can be higher than the structure itself.




Damage to health infrastructure in Gujarat, India earthquake

An economic issue

- Health facilities **destroyed**: 1,813 (13 districts)
- The **cost** of rehabilitation and reconstruction estimated at €42 million.

Source: Ministry of Health, State Government of Gujarat



This is a problem that *can* be solved...

- Tools are available to reduce risk
 - ▶ Technical publications on vulnerability reduction in health facilities
 - ▶ Courses on Hospital Disaster Planning
 - ▶ Advocacy print and audiovisual material
 - ▶ **Hospital Safety Index**



What is the Hospital Safety Index?

- Rapid, reliable and low-cost diagnostic tool
- Easy to apply by a trained team of engineers, architects and health professionals
- Values entered in a spreadsheet (mathematic model)
- Four components: Location, Structural, Non-Structural and Functional
- 145 items or areas are assessed
- Three categories of safety: High, Average and Low



Hospital Safety Index

- Safe Hospitals Checklist
- Mathematical model
- The result: a score for a health facility's level of safety



What the Checklist Evaluates

- **Location** (geological, hydro-meteorological, environmental etc).
- **Structural safety** (history of the buildings, structural systems, construction materials etc)
- **Non-structural safety** (electrical, communications water supply systems etc.)
- **Organization** and management (disaster plans, EOC, preventive maintenance, etc.)



SAFE HOSPITALS CHECKLIST

Geographic location (mark with an X where applicable).

1.1 Hospital location Request the hospital team to provide the map(s) showing hazards at the site of the building.	Safety Level			
	Note: ranking indicates the level of SAFETY, NOT risk.			
	NO HAZARD	YES		
	LOW	AVERAGE	HIGH	
1.1.1 Geological phenomena				
Earthquakes Rate the safety level of the hospital in terms of geological and soil analyses.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Volcanic eruptions Refer to hazard maps to rate the safety level of the hospital in terms of its proximity to volcanoes and volcanic activity, lava and pyroclastic flow, and ash fall.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Landslides Refer to hazard maps to rate the safety level of the hospital in terms of landslides caused by unstable soils (among other causes).	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Tsunamis Refer to hazard maps to rate the safety level of the hospital in terms of previous tsunami events caused by submarine volcanic or seismic activity.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Structural safety of the building

2.1 Safety History	Safety Level		
	LOW	AVERAGE	HIGH
1. Has there been prior structural damage to the hospital as a result of natural phenomena? Determine whether structural reports indicate that the level of safety has been compromised. If no natural phenomena has occurred in the last 30 years, do not fill in any box – leave blank. <i>Low = Major damage; Average = Average/moderate damage; High = Minor damage.</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. Was the hospital repaired or built using current safety standards? Verify whether the building was repaired, the date of repairs, and whether repairs were carried out using current standards for safe buildings. <i>Low = Standards not applied; Average = Standards partially applied; High = Standards fully applied</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. Has the hospital been adapted or remodelled or modified, affecting the structural behaviour of the building? Verify whether modifications were carried out using current standards for safe buildings. <i>Low = Major remodelling or modifications have been carried out; Average = Average/moderate modifications; High = Minor changes or no remodelling or modification was needed.</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Non-structural safety

3.1 Critical systems	Safety Level		
	LOW	AVERAGE	HIGH
Electrical system • Generator has capacity to meet 100% of demand. Verify that the generator begins to operate within seconds of the hospital losing power, covering power demands in the emergency department, intensive care unit, disinfection and sterilization unit, surgery, etc. Low = 0-30%; Average = 31-70%; High = 71-100%	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
• Performance of generator tested regularly in critical areas. Low = > 3 months; Average = 1-3 months; High = < 1 month.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
• Generator protected from potential damage due to natural phenomena Low = No; Average = Partially; High = Yes.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Mathematical Model Used to Obtain Results

- Values entered in an Excel spreadsheet
- Automatic check for errors
- Different weight applied to each item
- Formulas applied automatically
- Yields safety score for each component
- Results are output in graphic format

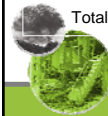


Mathematical model

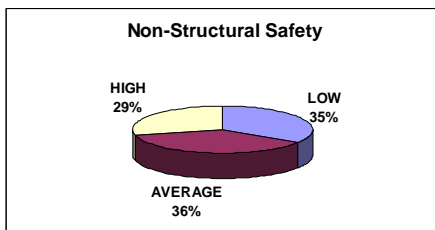
2.1 History of facility's safety	CONTROL	Safety Level		
		LOW	AVERAGE	HIGH
Has has been prior structural damage to the hospital as a result of natural phenomena Determine whether structural reports indicate that the level of safety has been compromised. If no natural phenomena has occurred in the last 30 years, do not fill in any box - leave blank. Low = Major damage; Average = Average/moderate damage; High = Minor damage.	BLANK			
Was the hospital built and repaired using current safety standards? Verify whether the building was repaired, the date of repairs, and whether repairs were carried out using current standards for safe buildings. Low = Standards not applied; Average = Standards partially applied; High = Standards fully applied.	ERROR	1	1	
Has the hospital been adapted or remodeled or modified affecting the structural behavior of the building? Verify whether modifications were carried out using current standards for safe buildings. Low = Major remodeling or modifications have been carried out; Average = Average/moderate modifications; High = Minor changes or no remodeling or modification was needed.	OK			1

Assessment of the Health Facility

Category	Unlikely to function	Likely to function	Highly likely to function	Total
Structural	7.50	24.38	18.13	50.00
Non-structural	10.36	10.98	8.67	30.00
Functional	6.93	6.92	6.15	20.00
Total	24.79	42.37	32.94	100.00



Safety of Non-structural Elements



The Result

Safety Score	Category	What should be done?
0 - 0.35	Category C	Urgent measures are required immediately, as the health facility's current safety levels are not sufficient to protect patients and staff during and after a disaster event.
0.36 - 0.65	Category B	Necessary measures are required at some point, as the health facility's current safety levels can potentially put at risk patients and staff during and after a disaster event.
0.66 - 1	Category A	Preventative measures are suggested at some point, as the health facility's current safety levels can cause acceptable damages, which nevertheless reduce the overall safety level of the installation.

Result for this facility: **Category B**



Role of the Evaluators

- Advocating to obtain approval/commitment from senior management.
- Applying the assessment instrument to facilities.
- Interpreting the results of the assessment and advising on priorities.



Role of the Evaluators

Advocacy

- Preliminary meetings with senior managers to explain the rationale and purpose of the “Safe Hospitals Initiative” and the assessment.
- Assurances of confidentiality of the results.



Role of the Evaluators

Applying the Safety Index

- Able to explain the purpose and rationale of the instrument to facility staff and others.
- Able to work as a member of a team to apply the assessment instrument.



Role of the Evaluators

Interpretation of the results

- Able to explain the basic methodology of scoring the instrument.
- Able to analyze the results, identify and justify priorities based on these.



The good news...

- Well-built or retrofitted hospitals **have** remained functioning following disasters.
- The health sector has excellent examples of and substantial accumulated experience contributing to safe health facilities.
- The knowledge exists to assess vulnerability and reduce risk in health facilities.

