

ANNEX I.

IMPLEMENTING A NATIONAL DISASTER MITIGATION PROGRAM FOR HOSPITALS

The objectives of this strategy are to ensure the performance of hospitals in the aftermath of a disaster (in this example, an earthquake). The strategy aims to:

- Reduce vulnerability,
- Implement the plan at a reasonable cost,
- Ensure the continuity of service.

1. ASSEMBLE A TEAM OF EXPERTS

This multi-disciplinary team should include engineers (structural, mechanical, civil, and sanitation engineers), architects, seismologists, etc. The team is responsible for considering the following aspects:

- Structure,
- Architectural elements,
- Lifelines,
- Equipment,
- Organization,
- Characteristics of the area surrounding the hospital (population, access, supporting infrastructure).

2. DESCRIBE THE HEALTH SYSTEM

Analyze the overall health system in terms of its past development and current organization. The analysis should include public sector facilities (ministry of health, social security, and military hospitals) and private hospitals. Interaction among the facilities and the level of complexity should be detailed.

3. ESTIMATE THE HAZARD

In the case of seismic hazards, general and local seismicity should be determined in terms of maximum intensities and local effects. If this type of information is

available for the region, it will be possible to estimate ground acceleration and expected displacement, and to establish design spectra.

The useful life of a hospital should be taken into account (30 years is a reasonable figure, both in terms of structural and functional characteristics). The level of acceptable risk is also defined (based on technical, economic, social, and political criteria).

4. CONDUCT A PRELIMINARY VULNERABILITY ANALYSIS

The first phase of the analysis is to prioritize the hospitals to be analyzed and to select the most appropriate strategy. Training should be carried out in a variety of sectors to ensure that the analysis is completed rapidly.

The vulnerability of a facility is quantified in terms of its structural, non-structural, and organizational, or functional elements.

5. SELECT BUILDINGS FOR ANALYSIS

Priority is given to highly vulnerable structures in high risk zones.

6. MAKE A QUANTITATIVE EVALUATION OF STRUCTURES

This is a detailed analysis, and solutions are recommended based on specific standards.

- Review architectural, structural, and installation diagrams;
- Compare diagrams and structure to verify whether construction actually followed the original design;
- Analyze quality and characteristics of construction materials;
- Use mathematical models depending on seismic resistant classification;
- Calculate cost-effectiveness of retrofitting.

7. PRIORITIZE THE INVESTMENT IN PROJECTS

To prioritize projects for investment, the team must consider organizational, political, technical, and financial criteria. If there are not sufficient resources to implement measures in all hospitals, the work can be programmed in phases.

8. PRODUCE A DETAILED RETROFITTING PLAN AND ARRANGE FINANCING

In this phase, the retrofitting plan for a specific project is produced, taking into account that the hospital must remain operational while construction is under way. Ideally, financing should come from national sources.

9. EXECUTE THE MITIGATION PROJECT