

The KnowRISK project

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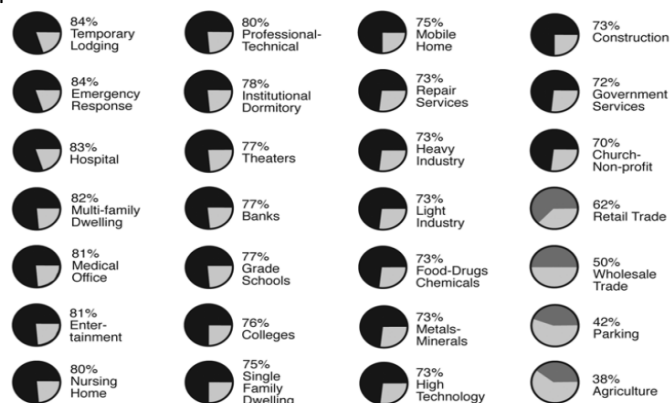
Summary - Most of a building is non-structural; for almost all occupancy types and at least 70% of the total cost is invested in the non-structural components. Damage of these elements often contributes significantly to earthquake impacts and can strongly influence the ability of communities to cope with and recover from earthquakes. The project “Know your city, Reduce seismic risk through non-structural elements, KnowRISK” aims at facilitating local communities’ access to expert knowledge on non-structural seismic protection solutions. The project will study seismic scenarios critical for non-structural damage, produce a portfolio of non-structural protection measures and investigate the level of awareness in specific communities. Risk communication strategies will be implemented taking into account the social and cultural background.

DID YOU KNOW THAT

Small Earthquakes can cause serious damage?

Damage is not just structural.

Most of a building is non-structural; almost all building occupancies, and at least 70% of the total cost is invested in non-structural components.



Circles represent total building costs (structural and non-structural); each circle is for a different type of occupancy. Shaded black highlights those type of occupancy for which non-structural costs is at least 70 % of total constructions costs; labels specify the exact percentage of non-structural costs. (HAZUS Technical Manual, 1997)

The kinds of risk posed by non-structural damage

Risk of injury, Loss of property and Functional loss

URM parapets can be a hazard due to inadequate bracing of the parapet walls, poor quality of the mortar and/or deterioration of the materials.

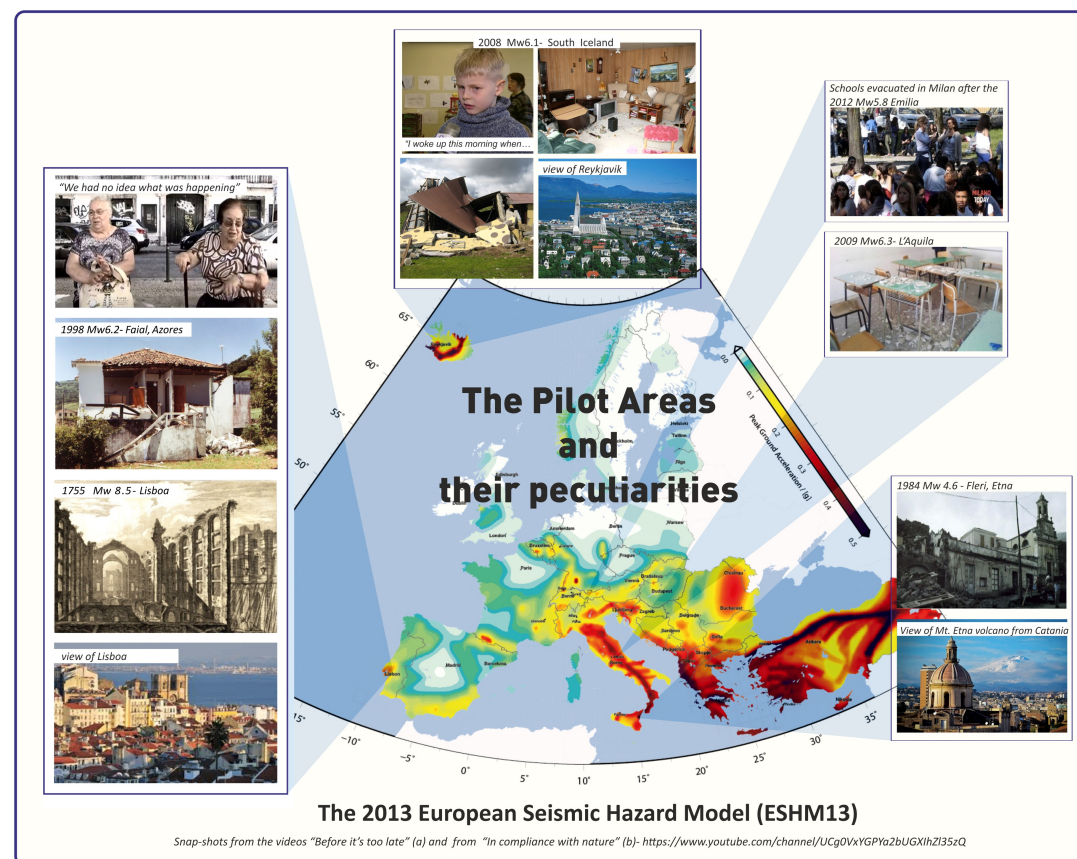
Statues and appendages may fall if the metal anchors are weak or too short.



Storefronts are the most likely glazing to be broken during an earthquake.



Large and heavy furniture - likely to overturn - should be fixed to a wall or bolted to the floor.



KNOWRISK PROJECT

Know and reduce non-structural seismic risk.

Seismic hazard is a matter of shaking, but it is risk that should matter to people. To address risk reduction in a more efficient way we will have a **community-based disaster risk reduction approach**. Multi-stakeholder collaboration will be coupled with the need to adjust actions to local communities’ characteristics (Mercer, 2012; MacCall, 2012; Yamori, 2007).

The pilot-areas will be studied to assess the **local societal seismic vulnerability, population dynamics, and identification of vulnerable groups**. The three participating countries have indeed different situations: **the last strong earthquakes in Lisbon occurred long ago**, too long for being remembered by local people; in Italy, where earthquakes are frequent, people **mostly think of structural vulnerability**; in Iceland, the last strong earthquake is remembered as **causing mostly non-structural damage**.

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RESEARCH ACTIONS



Risk maps (task B)

- **Hazard analysis**: Definition of seismic scenarios critical for non-structural damage (VI, VII EMS)
- Visualization of risk in the form of **user friendly maps**

Non-structural seismic risk reduction (Task C)

- **Portfolio**: good practices to reduce the most common non-structural vulnerabilities
- **Shake table tests**: assessment of seismic performance of non-structural elements in bedroom and kitchen and films production



Approaching target communities (Task D)

- **Perception** assessment of non-structural vulnerability by local communities
- **Impact assessment** of risk communication activities: *Ex ante* and *Ex post* surveys

Risk communication strategies (Task E):

- **The engagement model**: we will implement a protocol of intervention based on the engagement of public (schools and citizen)



PREVENTION ACTIONS



Risk communication (Task E):

- **Practical Guide** of non-structural risk reduction for lay-people: low-cost measures easily implemented, multilingual and user-friendly
- Focus groups and participatory actions to selected communities
- **"Know your school: be safe!"** risk communication campaign to students
- **Augmented reality** technology for educational shake table

Dissemination of good practices (Task F)

References

Mercer, J. (2012). "Knowledge and disaster risk reduction", in B. Wisner, J.C. Gaillard, I. Kellman ed. The Routledge Handbook of Hazards and Disaster Risk Reduction. London and New York: Routledge.
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