

Special issue

Empowering communities for non-structural seismic risk mitigation: the central role of communication”

Foreword

This special issue of “Annals of Geophysics” concerns the dissemination of knowledge on the prevention of damage mainly due to non-structural elements during earthquakes and its practical application at houses, schools and offices by common citizens, companies and institutions. The seismic capacity of buildings and other civil engineering structures and infrastructures are object of regulations for design and construction, and in some cases also the design, fabrication and mounting of electrical and mechanical equipments. Consequently, even in strong earthquakes many collapses of buildings and infrastructures are avoided. However, with few exceptions, design procedures do not aim at avoiding seismic vibrations from being transferred to the structures, but enable the structures to resist to the effects of those vibrations. This means that non-structural elements, including contents, furniture, personal objects and working devices, will be subject to shaking, with the potential to cause damage, injuries and loss of life. Therefore, the reduction of damage due to non-structural elements has a relevant role in the reduction of material and human damage due to earthquakes, especially in developed societies, where other measures and policies aiming at the reduction of structural damage are enforced.

Actions to reduce non-structural damage require the participation and involvement of the public in general, at home and at work places. Thus, the transference of knowledge and raising awareness of the general public regarding seismic risk and the potential contribution of common citizens to reduce it, is critically important. This was the aim of the European Union (Humanitarian Aid & Civil/Protection) ECHO funded project **KnowRISK** (“Know your city, Reduce seiSMic riSk through non-structural elements”). The project sought to facilitate access to the local community to specialist knowledge on non-structural seismic risk protection solutions. Scientific knowledge was turned into practical knowledge to be used by citizens and to engage communities in disaster risk reduction. Several tools, such as guides, portfolios, serious games, videos, and augmented reality were designed and disseminated to communicate, teach and help different sectors of society, namely the population in general, students and selected stakeholders, in order to reduce seismic risk associated with damage due to non-structural elements.

In the three participant countries different type of stakeholders such as schools, engineers, architects, facility managers, historical downtown citizens, civil protection officers, etc., gave their contribution to the project in different ways, and this was crucial to develop specific communication techniques and tools. This special issue of Annals of Geophysics discusses the relevance of risk communication to common citizens, students and the business sector, and contains a set of papers that provide an overall view of the project results and two guest papers that point out how important is the communication for the reduction of seismic risk.

There are three key points that the KnowRISK project posed at the core of its risk mitigation action and communication strategy: “Move, protect, secure”. They were highlighted throughout the whole process, from research to action, and were turned into a simple three words slogan to guide stepwise to the increase in safety. “Move” refers to simply rearranging items that might fall, “protect” refers to valuable and fragile items, “secure” refers to anchoring tall or loose items. The increase in safety goes along with the needs for higher level of expertise: from simple interventions that can also be carried out by householders to retrofits that absolutely requires specific skills.

Papers by Ferreira et al. and by Solarino et al. identify the non-structural elements most commonly damaged by earthquakes with greater impact, and present communication tools to address citizens, students and the building sector, in order to turn research into preventive actions. Thorvaldsdottir et al. develop guidelines for risk reduction based on an extensive portfolio of photos and assessment of non-structural earthquake damage in residences in South Iceland. Those guidelines can be applied not only to residences but also to offices, industrial facilities, hospitals and government services. Ferreira et al. extend the scope from housing to business by means of engaging stakeholders of this sector to develop knowledge on the reduction of non-structural damage in office buildings, shops, warehouses and other facilities, as well as communication of results.

In the KnowRISK project, a large emphasis was placed on engaging young people, as it is one of the most effective means of risk mitigation in the long run as they seed the roots that shape the future. Musacchio et al. describe this vision and systematize a protocol to communicate seismic risk in Italian schools, comprising design, test and assessment, while Piangiamore et al. present students' point of view concerning non-structural risk mitigation. Solarino et al. describe an approach to risk mitigation that stands on the ability that tools such as serious games have to instill in young people a proactive attitude.

Lastly, Falsaperla et al. describe how crucial is dissemination within a risk communication strategy.

Risk communication is also a key instrument in the studies reported by Kouskouna et al., that apply the risk game tree and its formation for the purpose of policy selection considering not only disaggregation of earthquake-related direct and cascading effects, but also risk communication.

KnowRISK is an attempt to engage stakeholders in non-structural risk mitigation in Europe, nevertheless Dey et al. present the need for a widespread dissemination of information on seismic hazard preparedness and action through community participation in North East India, the highest seismic hazard zone in whole India.

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