

How prepared individuals and communities are for evacuation in tsunami-prone areas in Europe? Findings from the ASTARTE EU Programme

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Understanding social vulnerability to tsunamis provides risk managers with the required information to determine whether individuals have the capacity to evacuate, and therefore to take mitigation measures to protect their communities. In the frame of the EU programme ASTARTE (Assessment, Strategy And Risk reduction for Tsunamis in Europe), we conducted a questionnaire-based survey among 1,661 people from 41 nationalities living in, working in, or visiting 10 Test Sites from 9 different countries. The questions, which have been translated in 11 languages, focused on tsunami hazard awareness, risk perception, and knowledge of the existing warning systems. Our results confirm our initial hypothesis that low attention is paid in Europe to tsunami risk. Among all type of hazards, either natural or not, tsunami rank first in only one site (Lyngen fjord in Norway), rank third in 3 other sites (Eforie Nord in Romania, Nice and Istanbul), rank 4 in Gulluk Bay, 5 in Sines and Heraklion, and 10 in Siracusa (Sicily) and San Jordi (Balearic Islands). Whatever the respondent's status (i.e. local population, local authorities, or tourists), earthquakes and drawdown of the sea are cited as tsunami warning signs by 43% and 39% of the respondents, respectively. Therefore self-evacuation is not expected for more than half of the population. Considering that most European countries have no early warning system for tsunamis, a disaster is likely to happen in any coastal area exposed to this specific hazard. Furthermore, knowledge of past tsunami events is also very limited: only 22% of people stated that a tsunami has occurred in the past, whereas a deadly tsunami occurs every century in the Mediterranean Sea (e.g. in AD 365, 1660, 1672 or 1956 in the eastern part, 1908, 1979 or 2003 in the western part), and high tsunami waves devastated the Portugal and Moroccan coasts in 1755. Despite this lack of knowledge and awareness of past events, 62% of the respondents think that the site of the interview could be affected by a tsunami in the future. Respondents were strongly influenced by the images of catastrophic tsunamis they have seen in 2004 and 2011, leading them to consider local wave heights >10 or 15m, even in low-exposed areas such as Nice or the Balearic Islands. Such overestimation of the wave heights could lead to confusion during an evacuation.

This survey at the European scale underlines the need to better mitigation strategies, including but not limited to inform residents, local workers and tourists of each site about: (1) the reality of the tsunami risk; (2) the maximal wave height that has been modelled for the worst case; and (3) where to evacuate in case of a future tsunami.

Key words:

tsunami, coastal risk, hazard knowledge, risk perception, vulnerability, resilience, evacuation, Europe