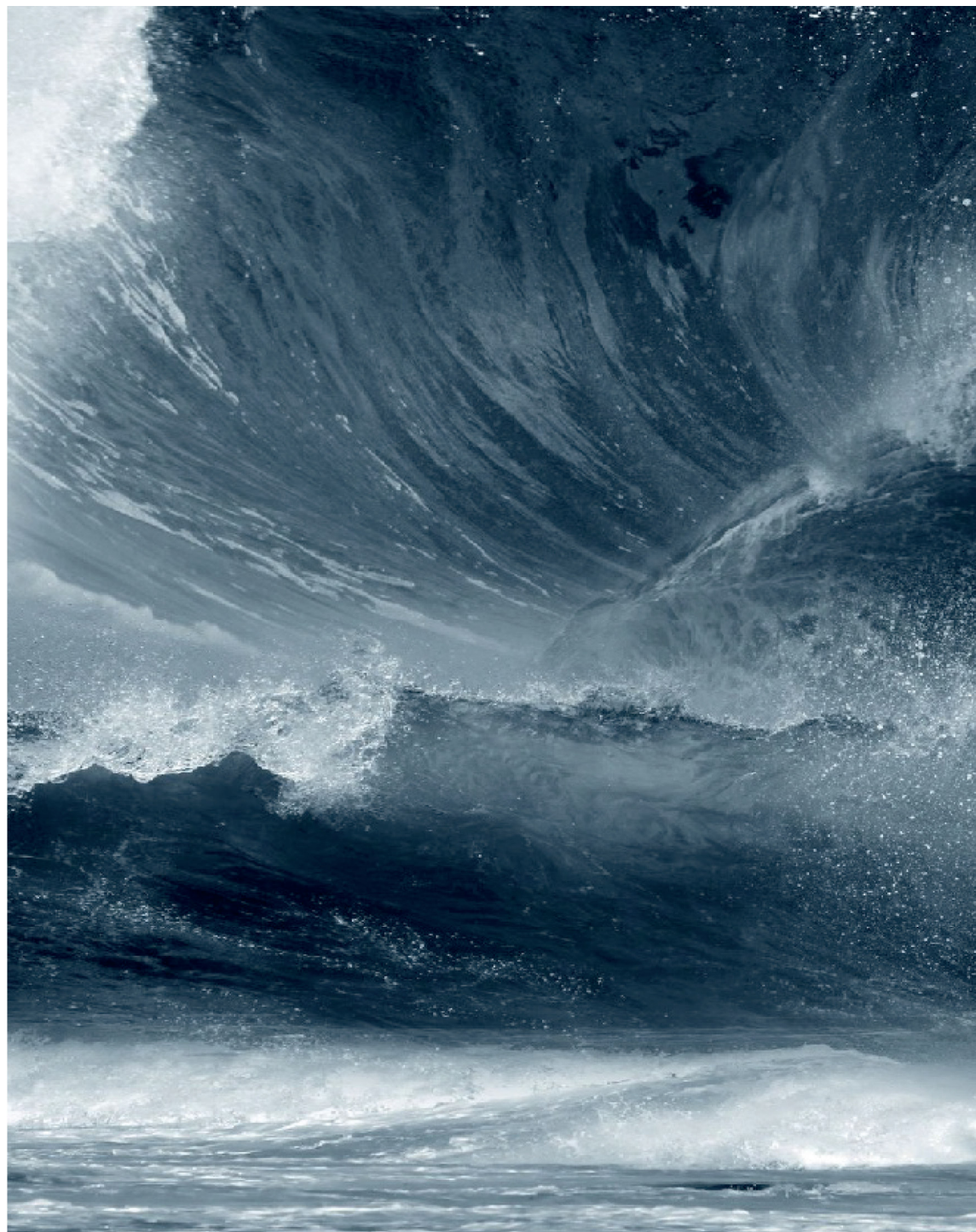


Tsunami Risk Perception in Southern Italy 2020

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Why making a research on tsunami's risk perception and understanding?

- To **collect data** on citizens' knowledge and characterization of tsunamis;
- To **assess how citizens perceive and understand tsunamis** and investigate their related mental models;
- To identify the **most appropriate messages and channels** to spread risk communication and alert messages;
- To **improve communication strategies** and their effectiveness through different channels.
- To study the differences in tsunami risk perception for coastal areas and **understand how the environmental, social and psychological (and memory) context** can influence it.



About risk perception studies

Studies of risk perception examine the opinions people express when they are asked to characterize and evaluate hazardous activities and technologies.

This research aims to aid risk analysis and societal decision making by:

- improving methods for **eliciting opinions about risk**,
- providing a basis for **understanding and anticipating public responses to hazards**
- **Improving the communication of risk information** among laypeople, technical experts, and policy makers.

Paul Slovic P., Fischhoff B., Lichtenstein S. (1982), Why Study Risk Perception?. Risk Analysis, 2:83-93.

Perception is not simple knowledge of risk

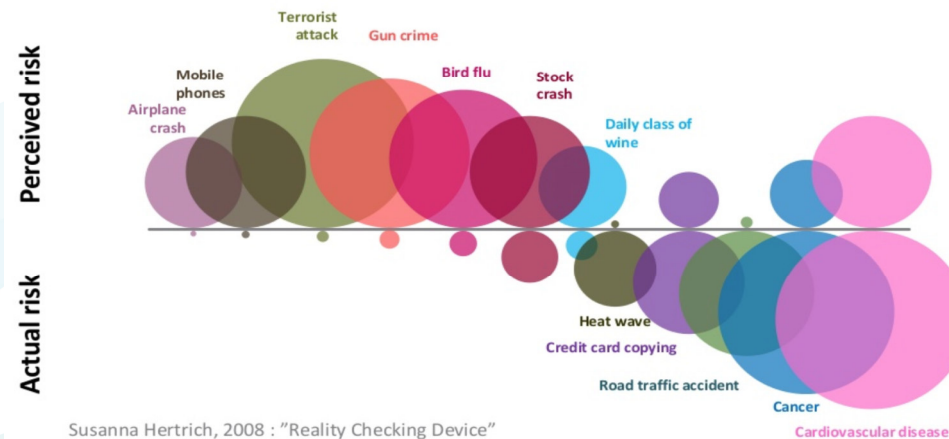


Perceived risks and real hazard

“Studies of risk perception examine the judgments people make when they are asked to characterize and evaluate hazardous activities and technologies”.

These judgments almost never depend on real risk.

Perceived Risk and Actual Risk



However, perception is for humans the first fundamental step to know reality and to know and evaluate risk.

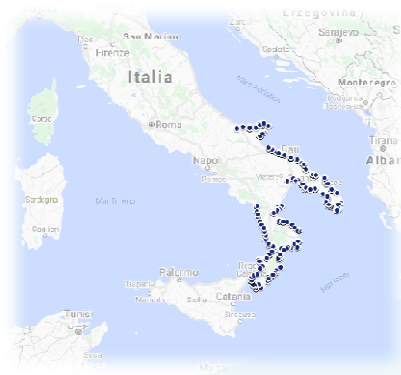


The first phase of the survey

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Natural Hazards
and Earth System
Sciences



Tsunami risk perception in southern Italy: first evidence from a sample survey

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Abstract. The Italian Tsunami Alert Centre of the Istituto Nazionale di Geofisica e Vulcanologia (Centro di Allerta Tsunami, hereinafter CAT-INGV) supported a computer-assisted telephone interview (CATI) survey to investigate tsunami risk perception in two pilot regions of southern Italy. The survey was carried out on a stratified sample of 1021 interviewees representing about 3.2 million people living in 183 coastal municipalities of the two regions, namely Calabria and Apulia. The main goal of this research is to verify whether and how people's perception of tsunami hazard compares to the results of (PTHA) – probabilistic tsunami hazard assessment (TSUMAPS-NEAM project; Basili et al., 2018). As shown by the results of this project, both investigated regions are characterised by high tsunami hazard. Nonetheless, the long return time of such events could lead people to consider the occurrence of a tsunami in the Mediterranean Sea to be very unlikely.

The survey results reveal that people's risk perception is low: for almost half of the whole sample the occurrence of a tsunami in the Mediterranean Sea is considered quite unlikely, with a clear difference between Apulia and Calabria. In the latter region the risk perception is much higher than in the former, probably due to the shorter time elapsed since the last event. Also, belonging to different coastal areas¹ appears to have a significant influence on the way tsunami haz-

ard is conceived, having a stronger effect on risk characterisation: the interviewees of Tyrrhenian Calabria are indeed more likely to associate tsunami risk with volcanoes than the Ionian citizens. This is coherent considering the presence of active volcanoes and related tsunami precedents in the Tyrrhenian.

Television emerged as the most relevant source of knowledge for almost 90 % of the sample, and the influence of media also results in the way tsunami risk is characterised. In particular, the survey showed that people's perception and understanding of tsunamis are affected by media accounts of large events, such as the 2004 Sumatra and the 2011 Japan tsunamis. At the same time, it is evident that the risk posed by smaller events is underrated. Furthermore, the survey's results show that the word "tsunami" occupies a different semantic space in comparison to the Italian traditional headword *maremoto*, with differences among sample strata. In other words, the same physical phenomenon would be understood in two different ways by younger, educated people and elders with a low education level. The results of this study, although limited to two regions, provide a first assessment of tsunami risk perception in Italy, also entailing important consequences for both risk communication practice and mitigation policies.

¹For the purposes of this paper, the term "coastal area" refers to the part of the coastline defined by both seas and regions' limits, according to current geographical conventions. Tyrrhenian Calabria indicates the coastal region between the municipalities of Tortora and Scilla, Ionian Calabria spans from Reggio Calabria to Rocca Imperiale; Ionian Apulia from Ginosa to Castrignano del Capo, and Adriatic Apulia from Gagliano del Capo to Chieuti.

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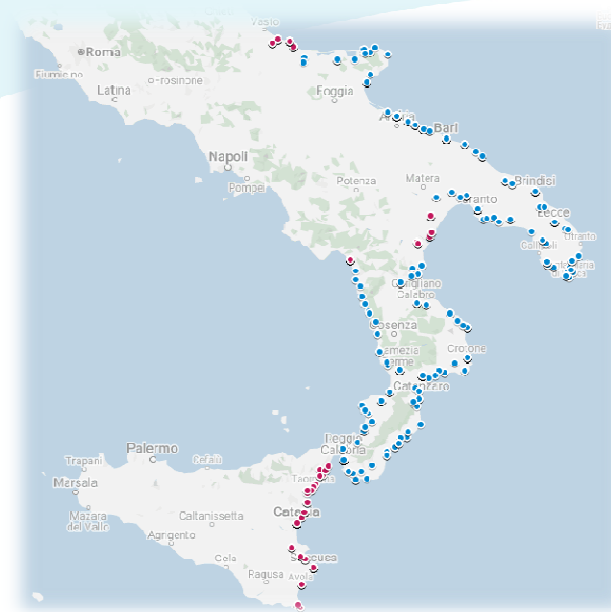
The second phase of the survey

The second phase of the survey was carried out between 27 December 2019 and 8 January 2020.

614 CATI (Computer-Assisted Telephone Interviewing) **telephone interviews** were completed in the regions of Adriatic Molise, Adriatic and Thyrrenian Basilicata and Eastern Sicily (Ionian).

Distribution of interviews:

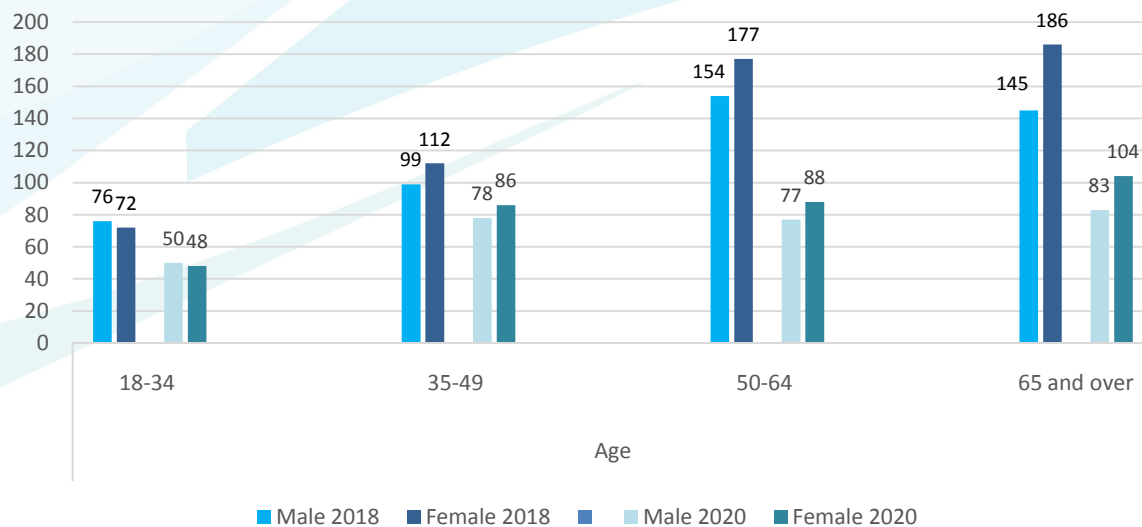
- First survey municipalities 2018 (**1021** interviews in **183** coastal municipalities)
- Second survey municipalities 2020 (**614** interviews in **37** coastal municipalities)



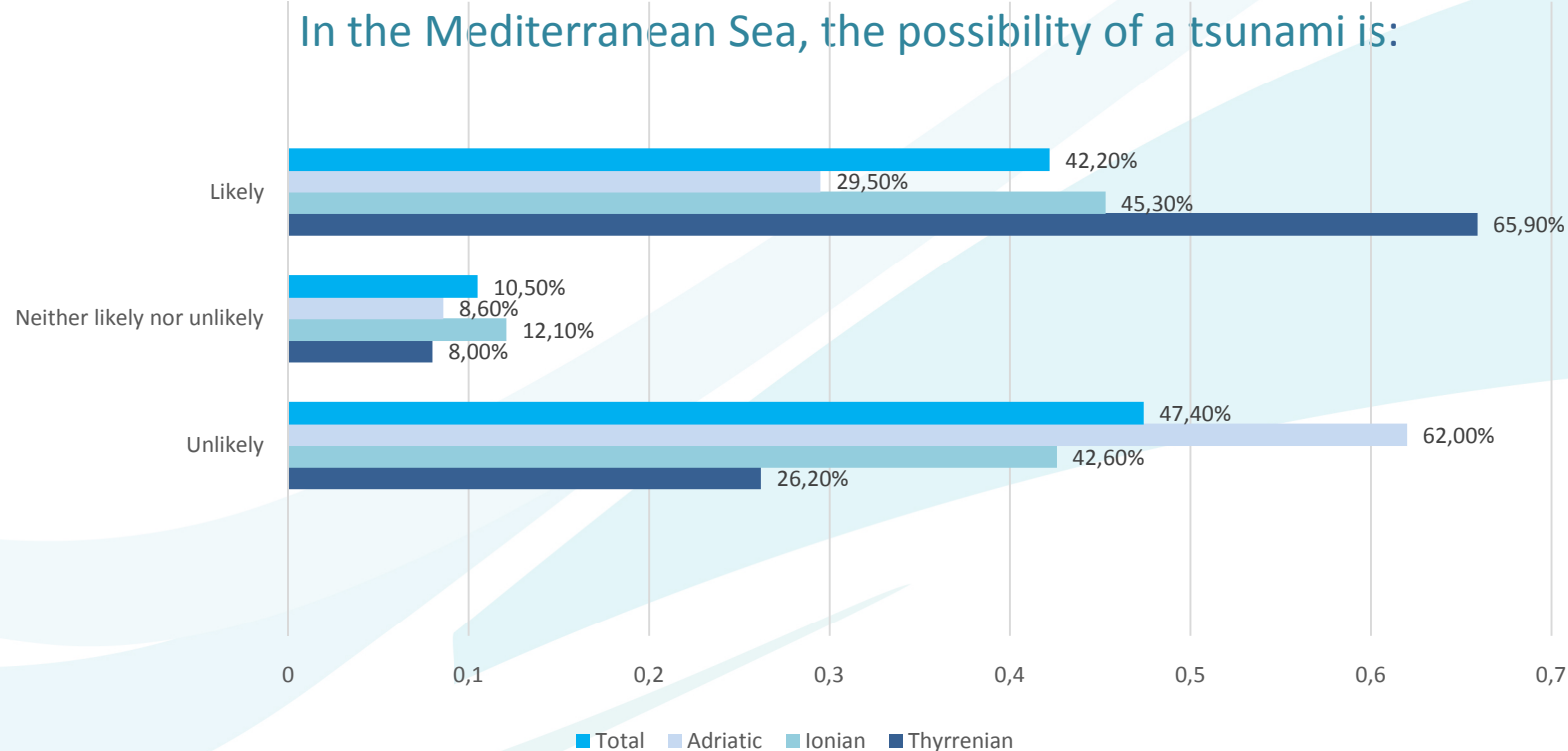
Reference Universe

Country	Phase	Residents	Coastal Municipalities	
Italy		17.689.240	668	
Pilot Regions				
Apulia	I^	1.716.797	67	
Calabria	I^	1.120.698	116	
Molise	II^	43.800	4	
Basilicata	II^	58.345	7	
Sicilia Orientale	II^	834.881	29	
Total	I^ + II^	3.774.521	223	
Coast				
Tyrrhenian Coast	I^	Calabria	561.908	45
	II^	Basilicata	4.415	1
Adriatic	I^	Apulia	1.247.753	46
	II^	Molise	43.800	4
Ionian	I^	Calabria	558.790	71
	I^	Apulia	469.044	21
	II^	Basilicata	53.930	6
	II^	Sicilia Jonio Catania	355.514	7
	II^	Sicilia Jonio Messina	243.763	13
II^	Sicilia Jonio Siracusa	235.604	9	
Total	I^ + II^	3.774.521	223	

Stratification variables: Gender and Age



Tsunami risk perception in southern Italy

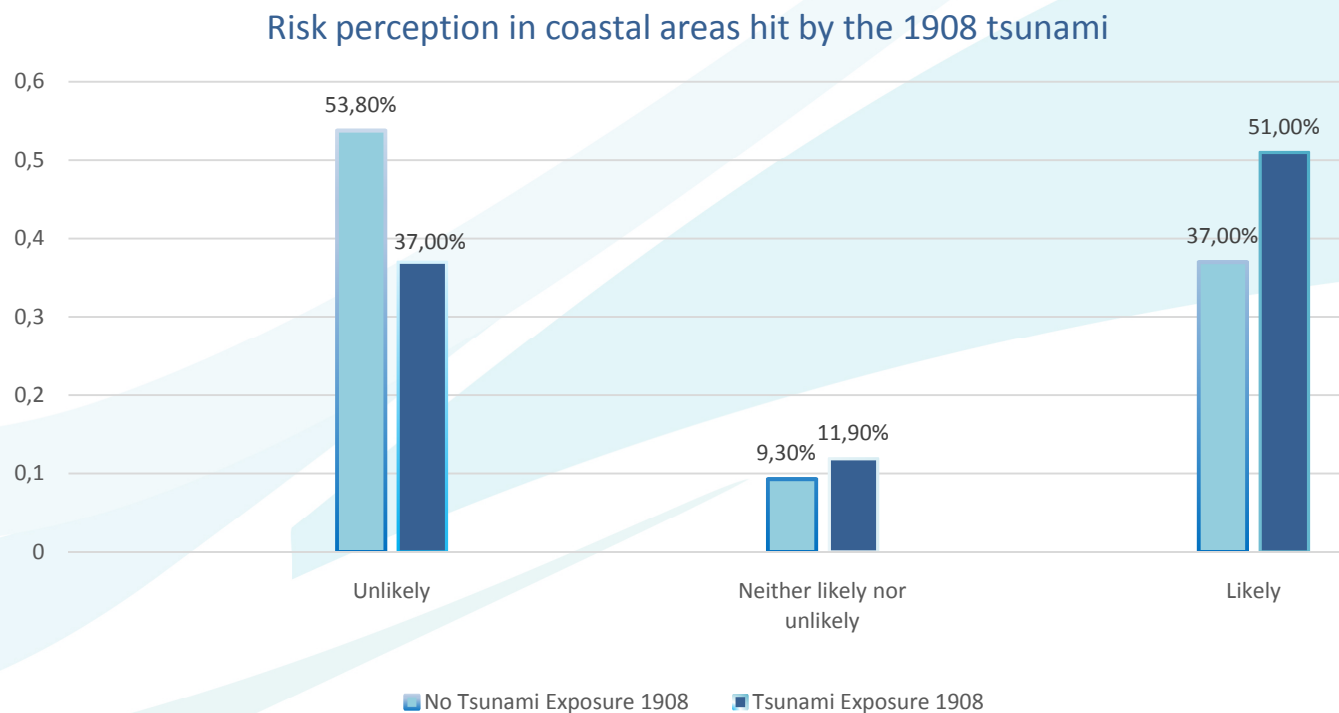


The graph is clear, in southern Italy the perception of tsunami risk is **low**. It is possible to observe two interesting information detected in the Adriatic coast, where the perception is very low due to the loss of historical memory and the events that occurred in the remote past, even if damaging. The **high level** of perception of tsunami risk in the **Tyrrhenian coast** is associated with the presence of active volcanoes in the sea (e.g. Marsili), the 2002 Stromboli tsunami and the historical memory of the 1908 tsunami (Messina and Reggio Calabria).



Tsunami risk perception in 1908 tsunami areas

Are the citizens living today in the coastal areas that were hit by the Tsunami generated by the earthquake in 1908, aware that they live in tsunami-prone areas?



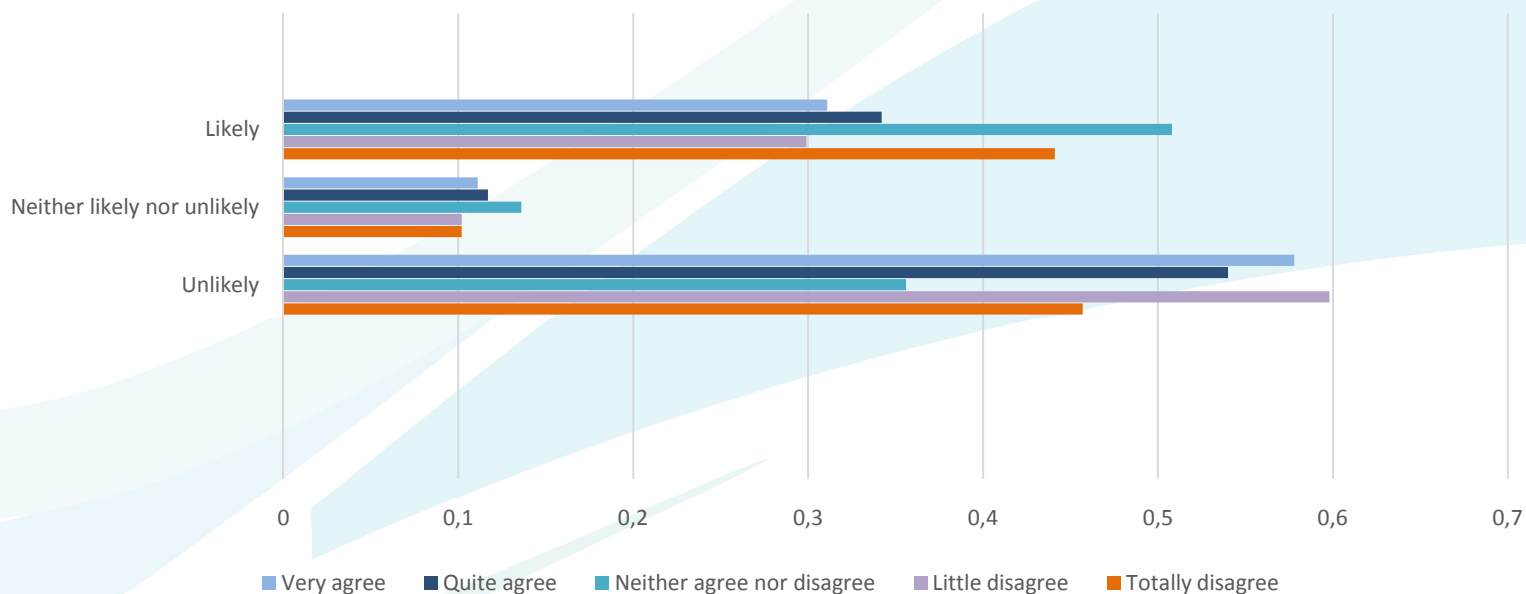
51% of respondents living today **in coastal areas affected** by the 1908 tsunami are **aware** that they live in an area at risk. It can be seen in the graph that **53.8%** of citizens living in coastal areas **not affected** by the tsunami are not aware of this risk.



Tsunami risk perception & behaviour

If you're near the coast and you feel a strong earthquake, will you run to the beach?

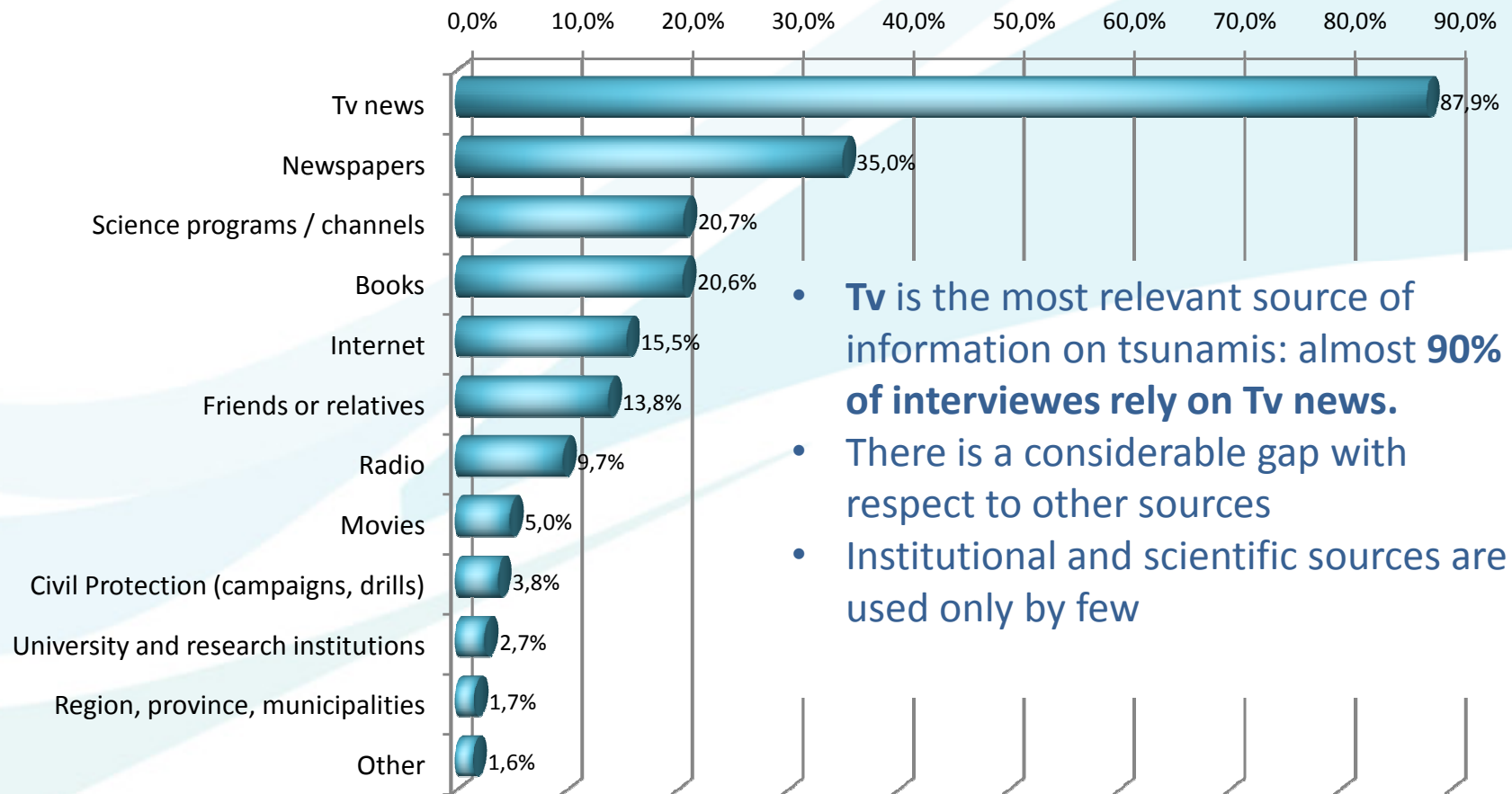
Tsunami awareness indicator



In the graph are represented respectively: in the "X" axis the perception of the tsunami risk in the area where you live and, in the "Y" axis, the answer to the above question. The result shows that those who have a **better perception of tsunami risk also have a greater knowledge of the phenomenon**. Those who have a **low perception of risk**, on the other hand, would **not behave correctly in case of danger**.



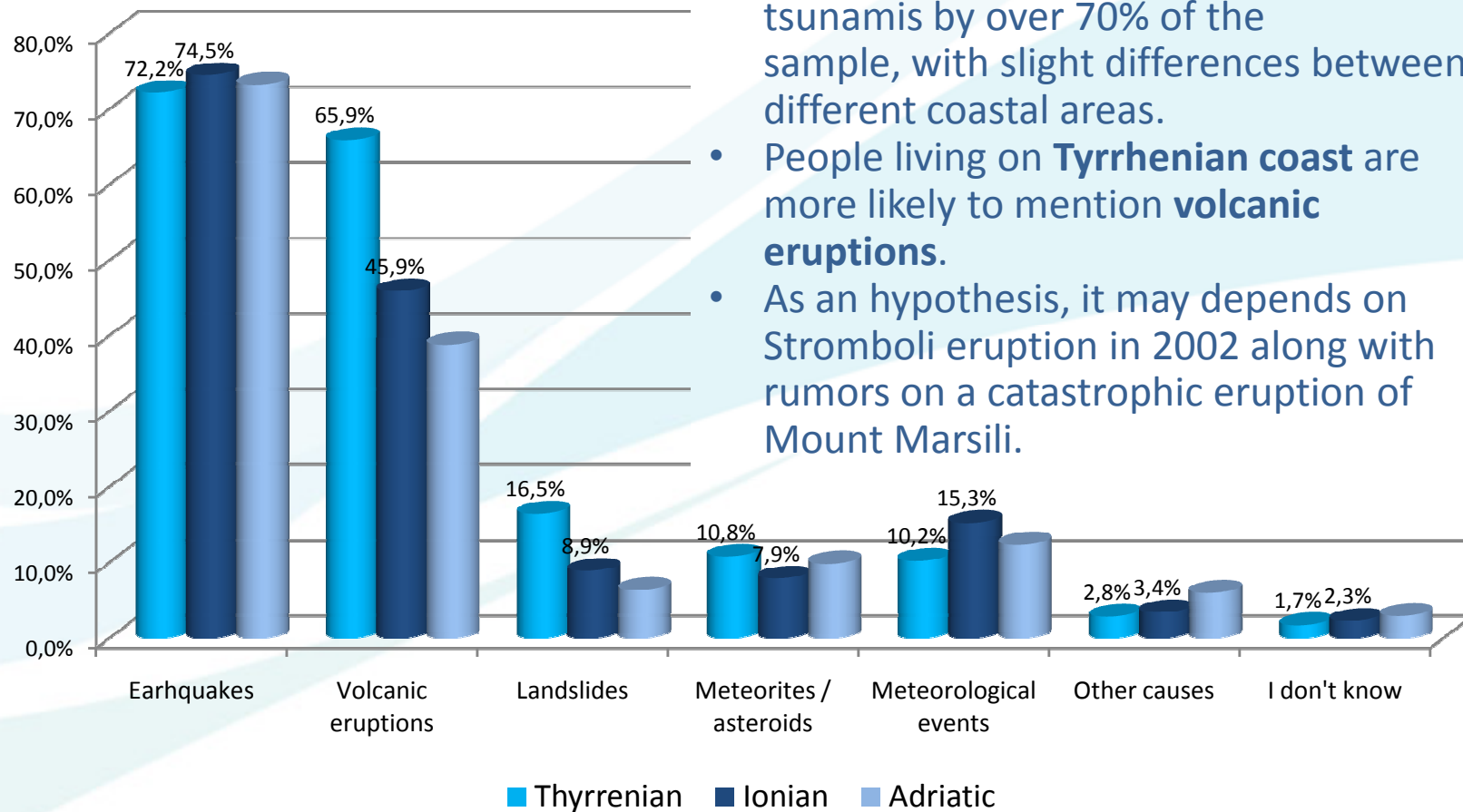
Source of information



- **Tv** is the most relevant source of information on tsunamis: almost **90% of interviewees rely on Tv news.**
- There is a considerable gap with respect to other sources
- Institutional and scientific sources are used only by few



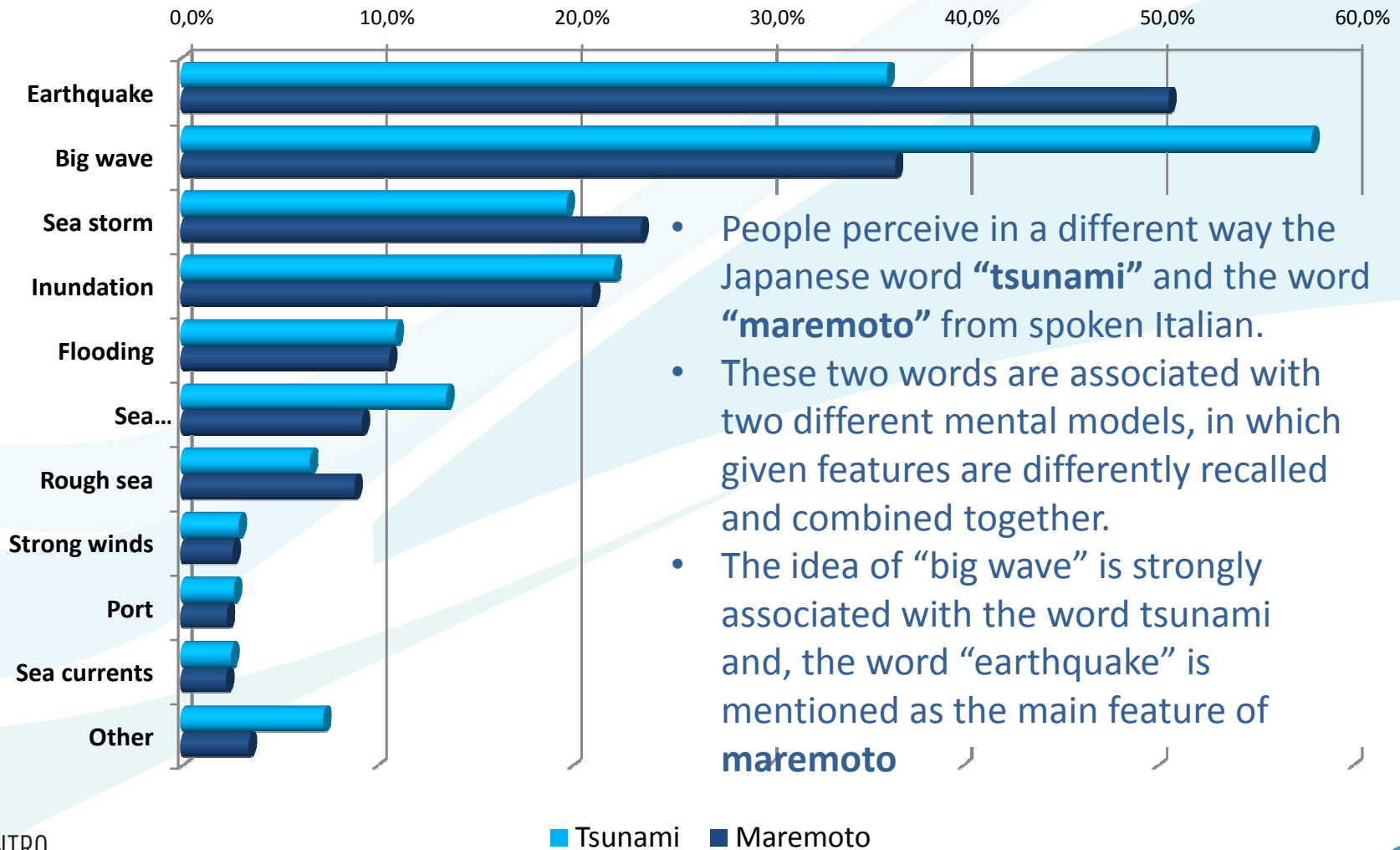
Causes of Tsunamis by coastal area



- **Earthquakes** are seen as a cause of tsunamis by over 70% of the sample, with slight differences between different coastal areas.
- People living on **Tyrrhenian coast** are more likely to mention **volcanic eruptions**.
- As an hypothesis, it may depends on Stromboli eruption in 2002 along with rumors on a catastrophic eruption of Mount Marsili.



Elicitation «tsunami» vs «maremoto»



Conclusion

The two phases of the survey enhance the starting hypotheses:

- The perception of tsunami risk in southern Italy is low and there is no knowledge of the phenomenon.
- The coastal areas affected by the tsunami of 1908 (Tsunami of Messina and Reggio Calabria), preserve a bit the memory of the event.
- The Tyrrhenian coastal areas reveal a greater perception of the tsunami risk induced by the fear of active submerged volcanoes, the frequent eruptions of the island of Stromboli and historical memory.
- The earthquake is seen as the major cause of tsunamis followed by volcanoes (with peaks in the Tyrrhenian areas).
- TV is confirmed as the major source of communication (87.9%).
- The word Tsunami is associated with big waves, while the word Maremoto is more related to earthquake and in the Italian ideal, more evocative of the phenomenon.

