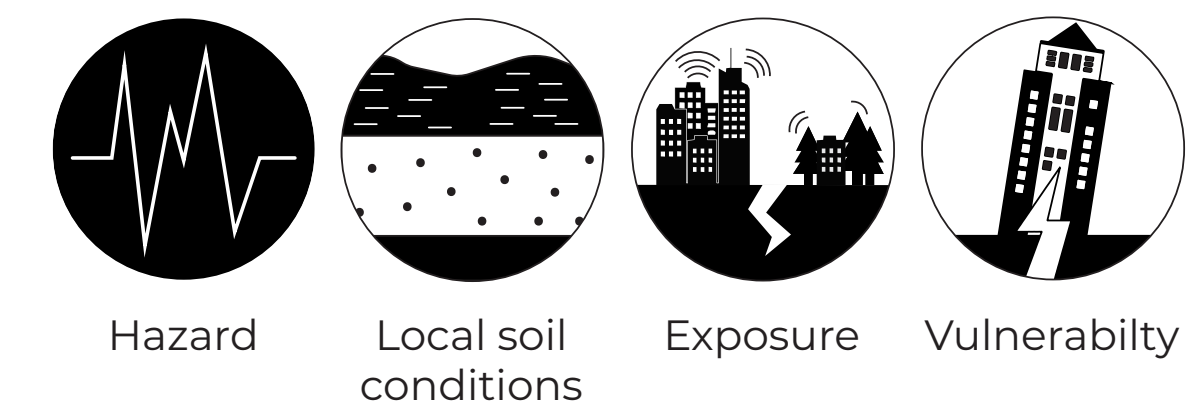


The EARTHQUAKE RISK map of Europe

WHAT IS EARTHQUAKE RISK?

Earthquake risk describes the potential effects that earthquakes can have on communities. A profound understanding of the earthquake hazard and local soil conditions, which tells us about the expected levels of future ground shaking, is a prerequisite for defining earthquake risk, together with the location and value of buildings (exposure) and their susceptibility to damage (vulnerability).



HOW TO READ THE EARTHQUAKE RISK MAP OF EUROPE

The earthquake risk map of Europe illustrates the relative distribution of risk due to earthquakes across Europe through an index. This index combines quantities of average annual economic loss and average annual loss of life, calculated from the 2020 European Seismic Risk Model, normalised by the GDP per capita to account for the varying levels of resilience across Europe.

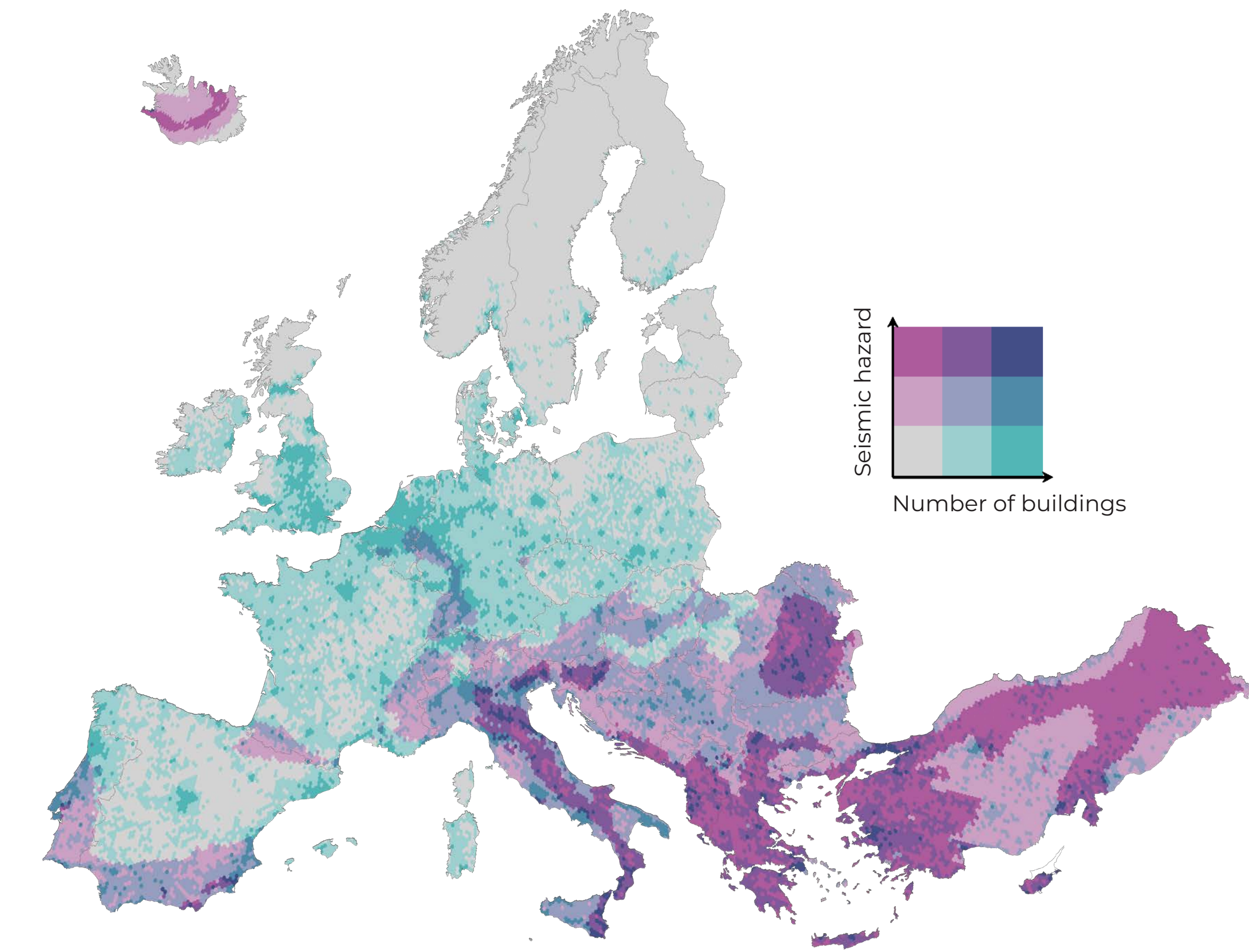
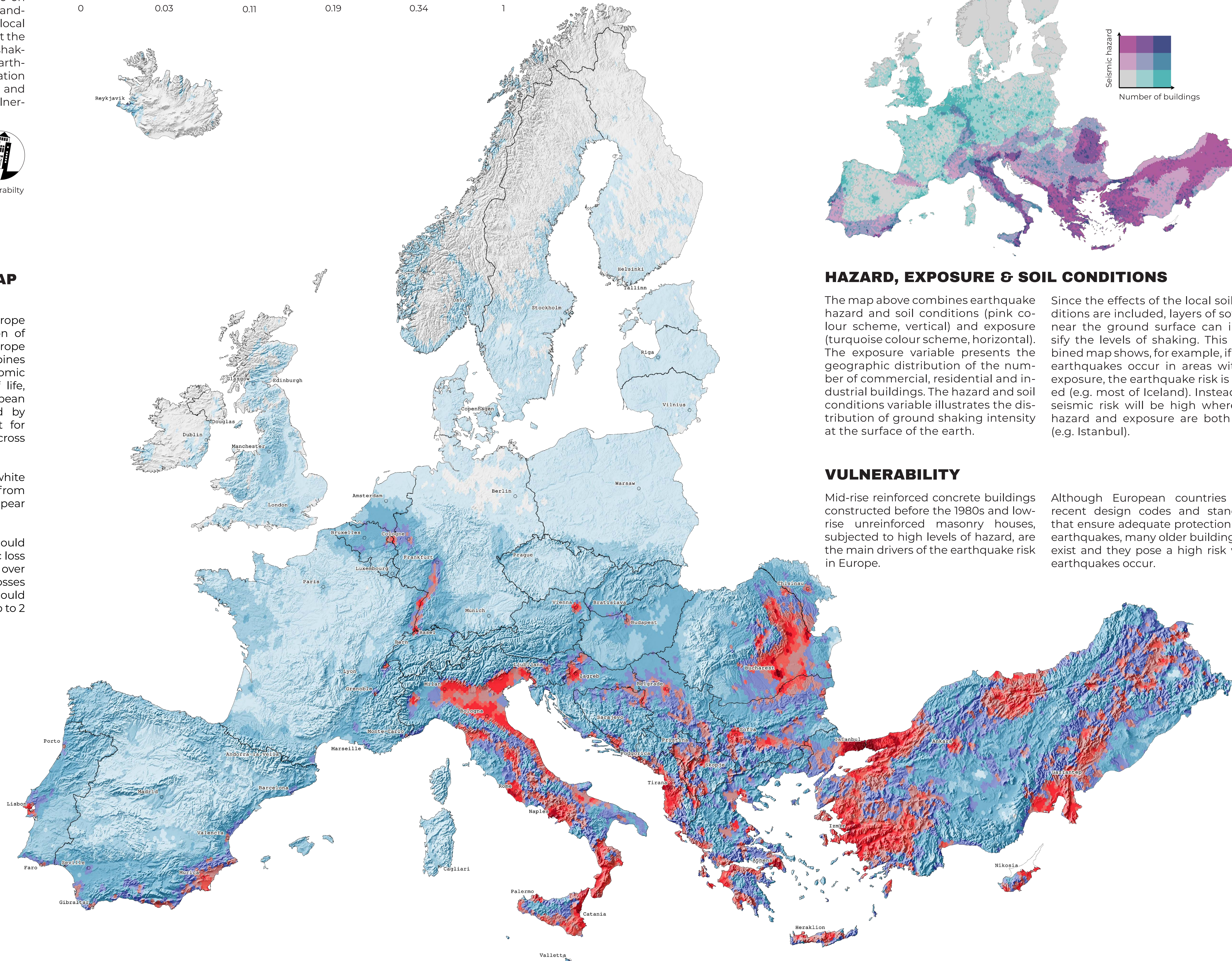
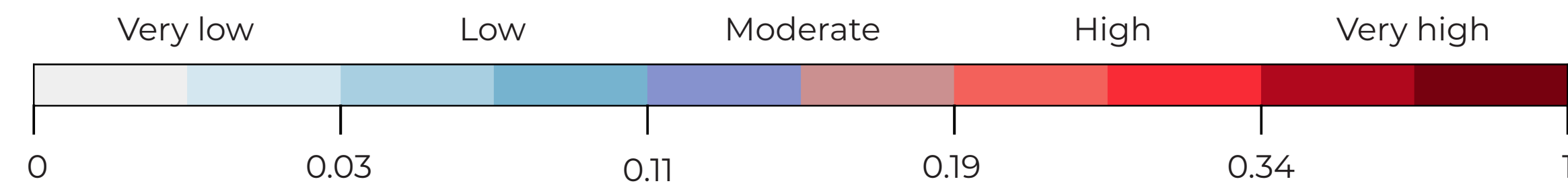
Low risk areas are coloured from white to light blue, moderate risk areas from blue to red and high risk areas appear in dark red.

The "very high" risk index areas could have an average annual economic loss of up to 65 M EUR and could reach over 30 fatalities a year, whereas the losses in a "moderate" risk index area could instead be up to 25 M EUR, with up to 2 fatalities per year.

READING EXAMPLE: ISTANBUL

- The North Anatolian Fault, one of the most active faults in the world, runs 20 km south of Istanbul. The proximity of this fault makes Istanbul one of the most seismic regions in Europe.
- Istanbul metropolitan area is situated on various soil types. Due to the soft soils present in the southern area, stronger ground shaking is expected in this area of the city.
- With 15.1 million inhabitants, Istanbul is the largest city in Europe by population. Due to the concentration of population and economic activity near active faults, Istanbul is highly exposed to seismic hazard.
- A considerable proportion of the buildings in Istanbul are designed and constructed without adequate seismic protection. As a result, these buildings are more prone to earthquake damage.

THE EARTHQUAKE RISK INDEX MAP



HAZARD, EXPOSURE & SOIL CONDITIONS

The map above combines earthquake hazard and soil conditions (pink colour scheme, vertical) and exposure (turquoise colour scheme, horizontal). The exposure variable presents the geographic distribution of the number of commercial, residential and industrial buildings. The hazard and soil conditions variable illustrates the distribution of ground shaking intensity at the surface of the earth.

Since the effects of the local soil conditions are included, layers of soft soil near the ground surface can intensify the levels of shaking. This combined map shows, for example, if large earthquakes occur in areas without exposure, the earthquake risk is limited (e.g. most of Iceland). Instead, the seismic risk will be high where the hazard and exposure are both high (e.g. Istanbul).

VULNERABILITY

Mid-rise reinforced concrete buildings constructed before the 1980s and low-rise unreinforced masonry houses, subjected to high levels of hazard, are the main drivers of the earthquake risk in Europe.

Although European countries have recent design codes and standards that ensure adequate protection from earthquakes, many older buildings still exist and they pose a high risk when earthquakes occur.

MORE INFORMATION

Discover more about earthquake hazard and risk across Europe at www.efehr.org.



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Many more have contributed to the development of ESRM20 by different means including data compilation and curation, knowledge exchange or by providing feedback at meetings and webinars. This has all been undertaken in close collaboration with the GEM Foundation and the European Plate Observing System (EPOS). Here you can find the list with all names and institutions:



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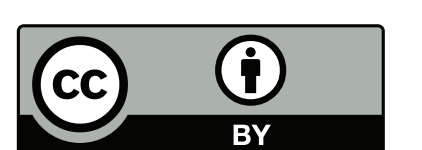


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