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Pyroclastic flow vulnerability assessment and mitigation around European volcanoes.

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Pyroclastic flows are one of the deadliest volcanic hazards, striking with a speed, temperature, and ash concentration that make survival difficult. Nonetheless, many cases exist of people surviving a pyroclastic flow, particularly when in a protected structure. Four main hazards from pyroclastic flows are examined in order to assess the vulnerabilities of, and the impacts on, structures and people within those structures. The hazards are flow pressure, ash infiltration causing fires or asphyxiation, temperature rise inside the structure, and fires external to the structure. The results indicate possible vulnerability reduction and mitigation options and suggest measures which civil defence and individuals could take to reduce their vulnerability and to increase their chances of surviving a pyroclastic flow, including taking action both before and during the eruption. Due to limitations of the work, care must taken in communicating these options and the limitations of the vulnerability assessment approach. This work contributes to the EU-funded project EXPLORIS (Explosive Eruption Risk and Decision Support for EU Populations Threatened by Volcanoes, EVR1-2001-00047).