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New hazard scenarios for Teide Pico-Viejo volcano complex and potential casualty risks.

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Recent research conducted in the Teide-Pico Viejo volcanic complex (TPVVC) shows that the next expected eruption might have a VEI 4. Geochronological data of different volcanic deposits in Tenerife island show that in the last 10,000 years TPVVC has experienced at least 16 eruptions with VEI 4 for 10 of them. These data are required to redefine the more expected eruptive scenario, expanding the impacting area. In this new scenario it is necessary to evacuate about 100,000 people among the inhabitants living in the valleys of the north of the island as well as some towns located to the west and south flank of the volcano, also affected by a likely volcanic eruption.

The initial approach (Official Emergency Plan) to use the hotel facilities located in the south of the island is no longer viable, requiring the evacuation by sea to other islands. The evacuation of such amount of people requires a highly organization, involving a virtual halt of the island and prepare a contingency plan on the available docks that allow a quick mobilization of people.
Furthermore, it is also necessary to evacuate all tourists who are currently in the island providing not only the closure of the Canarian Island airports due to ash fall, but also the air space around the archipelago and of northern Africa and the Iberian Peninsula.

In this new context, we have calculated Population Risk Curves from simulation of higher risk eruptive scenarios associated with a likely eruption on the Teide-Pico Viejo volcano complex. Parameters for simulations were obtained using a statistical model. This model assigns a probability function to the expected VEIs. Scenarios are simulated as a continuous function of the VEI value.
Next results determined how many people are affected by hazard scenarios. Final curves show the probability of potential causalities caused by an expected eruption in one year.

Results show that the number of expected causalities become important starting VEI 3.0 (from 100 to 20000 people with a variation of only 0.5 in the VEI). An increase in the number of expected causalities is obtained with very small variations of the hazard scenario probability (0.0003 to 0.0004 for 100 victims and more than 100000). With the current knowledge is impossible to predict between one hazard scenario and another, so the Emergency Plan has to take into account the worst-case scenario.