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Evaluation of risk posed by landslides in Italy

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Landslides are common events in Italy that cause damage every year. Systematic information exists on the consequences of landslides for the population of this country. In the period from 1900 to 2004, at least 7522 people were killed or were injured by slope failures in at least 1095 landslide damaging events. A national archive inventory listing 22,547 historical landslide events in the period between 1900 and 2003 is also available. For many of these landslide events, the exact or the approximate location is known. We use this information to attempt a quantitative, nationwide assessment of landslide risk to the population in Italy. For the purpose, we prepared a revised version of a map showing estimated levels of landslide hazard for each of the 8102 municipalities in Italy. This map was prepared through multivariate analysis of morphological, lithological and land use variables obtained from national-scale thematic databases, and attempts to explain the spatial distribution of the known historical landslide events (i.e., the events listed in the archive inventory). In the map, levels of landslide susceptibility are portrayed in 5 classes, from very low to very high. We prepare a new map showing the result of a similar multivariate statistical model that attempts to explain the spatial distribution of the direct damage to the population of Italy. The new model is constructed using the same set of independent environmental variables, and attempts to explain the spatial distribution of the landslide events that have resulted in deaths, missing persons and injured people in the period from 1900 to 2004. In this map levels of susceptibility to direct damage to the population are also shown in 5 classes, from very low to very high. We compare the two maps, and we discuss possible applications to landslide risk assessment at the national scale. In recent years, the Italian Government has repeatedly attempted to establish a compulsory national insurance against natural hazards, including landslides. The attempts have failed. Among the reasons for the inability to establish the mandatory insurance was the lack of a credible rationale for establishing such insurance. Our work, despite its

uncertainties, provides the data, the rationale and an analysis of the risk posed by landslides, and it may contribute to the establishment of compulsory insurance. It may also help decision makers and civil defence authorities to better focus limited resources for the mitigation and prevention of landslide hazards.