Guedes, Gilvan; Demography Department - Universidade Federal de Minas Gerais
gilvan@gilvanguedes.com
Authors: Gilvan Guedes (Demography Dept. | UFMG, Brazil - presenting author), Pedro Araújo (Statistics
Dept. | UFMG, Brazil), Rosangela Loschi (Statistics Dept. | UFMG, Brazil)

Title: Complementary or substitutes? The interplay between education and hazard experience in shaping preparedness behavior against flood hazards

The world has been witnessing an increasing number of climate-related events, such as droughts, landsliding and floods. Global databases suggest an exponential increase in the frequency and intensity of extreme weather episodes in the last decades. The low levels of preparedness worldwide are one of the major causes of human and material damages after major disasters. Theoretical models of preparedness behavior suggest that perceived costs and effectiveness of protective actions are the most important forces behind these patterns. Risk experience and cognitive skills are also key to understand why, when and how individuals prepare against hazards. Recent empirical studies have found that disaster experience and education are powerful resilience forces against potential loss among Asian countries. Based on the Protective Action Decision Model (PADM), this study explores the ways in which education and previous experience with floods may work as complementary or substitutes for individual protective behavior against flood hazards. Data analysis is based on a face-to-face probabilistic survey of adults under risk of river floods in Brazil. Our model improves previous efforts in many ways: it is based on a probabilistic sample, with 1226 individuals interviewed in a city with a large share of the population under risk of river floods; it introduces a hierarchical Bayesian ordered logistic model relating the probability of adopting protective measures against floods to covariates directly measured from individuals (education and previous experience with floods), as well as to latent covariates representing risk-aversion and perceptions about the effectiveness (PE) and the opportunity cost (PCO) of those measures; it measures PE and PCO through Bayesian item response theory (IRT) models, appropriately quantifying the uncertainty inherent to such quantities; it includes a random effect reflecting unmeasured individual features to correlate the individual responses to the different protective measures considered. Different from previous studies, we found that education is negatively associated with the propensity to prepare against floods, especially among those with disaster experience. Previous adaptation strategies among the highly educated are the likely explanation for this behavior, suggesting that anticipation skills are positive externalities from education for risk reduction.