

Tsunami alerts following severe earthquakes usually affect large geographical regions and require people to evacuate to higher safety zones. However, evacuation routes may be hindered by building debris and vehicles, thus leading to longer evacuation times and an increased risk of loss of life. Herein, we apply an agent-based model to study the evacuation situation of the coastal city of Iquique, north Chile, where most of the population is exposed to inundation from an incoming tsunami. The study evaluates different earthquake scenarios characterized by different ground motion intensities in terms of the evacuation process within a predefined inundation zone. Evacuating agents consider the microscale interactions with cars and other people using a collision avoidance algorithm. Results for the no ground shaking scenario are compared for validation with those of a real evacuation drill done in 2013 for the entire city. Finally, a parametric analysis is performed with ten different levels of ground motion intensity, showing that evacuation times for 95% of the population increase in 2.5 min on average when considering the effect of building debris.