WP4–Human factors simulation in BETs and definition of a related behavioral-based (B-based) resilience metric

T4.2 Simulators application to selected BETs in their current state and by applying current SUOD/SLOD standards mitigation strategies. Interferences assessment between selected SUOD/SLOD through simulation-based approach, with possible overlap of effects and related amplifications. Definition of a set of KPIs for overall resilience evaluation of BE and criteria for their correlation

D4.2.3 – SLOD KPIs for determining B-based resilience of BETs

ABSTRACT. The Built Environment risk and resilience is highly dependent on the BE users' reactions to the surrounding conditions. In fact, such reactions can drastically modify the exposure aspect of risk by modifying the way the built environment users are exposed to the environmental conditions that impose a stress on them, also depending on their individual vulnerability (e.g. motion speed and other fragilities in motion, health status). For that, simulation methods can be useful to determine the intensity and the extent to which the built environment users are exposed to a significant hazard. Moreover, reasoning on urban unit archetypes, as the ones established in previous steps of the project, are effective to robustly assess and determine potential recurring conditions. Then, to evaluate their resilience capacity time and area-weighted UTCI and AQI values are estimated to evaluate the severity of the BE user's exposure, then these are associated to their corresponding sweat rate (connected to the water loss) and health affection rate probability, and finally normalized by the total area of the BE analysed, to correlate it to its intrinsic properties. This was applied to the worst performing climate of the Italian context on every established built environment typology. Results obtain suggests that, under certain circumstances on an outdoor open space, a toddler exposed for just less than 3 hours (~4% water loss on body weight) can reach a dehydration risk state; and an exposure for 1-hour to very low concentrations of NO_2 can increase the mortality probability by approximately 1%.