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Host functional traits are a promising tool to predict infectious disease risk in the face of global change, but three major challenges remain. First, studies commonly assume fixed trait values for individuals of the same species, neglecting potential influences of within-species trait variation. Second, host adaptation to local pathogens is not necessarily reflected in commonly measured functional traits. Third, environmental gradients can modify trait-disease patterns which questions the idea of general and rigid “disease-traits” in hosts. In the present study, we aim to capture the roles of intraspecific trait variation, local adaptation and environmental conditions in driving disease risk using a reciprocal transplant experiment along a 1100m altitudinal gradient. We factorially crossed seed source elevation, soil source elevation and recipient elevation for four common alpine grassland species (*Dactylis glomerata, Phleum pratense, Plantago lanceolata, Plantago media*) on a low, intermediate, and high elevation site. At four timepoints within two growing seasons, we measured plant survival, height, specific leaf area, phenological status and foliar disease infection severity. Preliminary results show that plants that adapted to high elevation environments had more disease overall, indicating increased resistance in populations from low elevation origin. However, this effect weakened when plants were grown in soils from high elevations. We found trait-disease relationships, but they depended on the species and on the recipient elevation. Our results highlight the importance to further explore how host traits in different environments mediate pathogen infections, to understand how global change will shape future disease landscapes.