

Environmental change differentially mediated global re-emergence of zoonotic and anthroponotic infectious diseases from 1990 – 2010

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To understand whether selection for ecological generalism and specialism is evident in global infectious disease re-emergence, I model environmental disruption as a determinant for incidence of select globally-distributed diseases with zoonotic and anthroponotic transmission mechanisms. I use autoregressive zero-inflated negative binomial models to assess how changes in physical environment and socio-economic conditions related to excess national, annual incidence of seventeen diseases within 207 countries. Zoonotic transmission has greater environmental sensitivity than anthroponotic transmission. Physical environmental conditions appear prerequisite to autochthonous zoonotic disease incidence, while socio-economic change amplifies transmission of these pathogens once they are endemic. Among anthroponotic diseases, clear generalities across diseases and across transmission mechanisms do not arise. Taken together, these results indicate that environmental change differentially mediated global re-emergence of zoonotic and anthroponotic diseases from 1990 to 2010, and specifically that global re-emergence over this period reflected ecological dynamics arising at micro-environmental levels.

