

# Larger spatial scale decreases the magnitude of, but does not eliminate, the observed dilution effect for hantaviruses

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## Abstract

Despite important implications for biological conservation and public health, the potential generality of a prophylactic effect of biodiversity on zoonotic pathogen transmission (e.g., dilution effect) remains hotly debated, potentially because existing studies focus on different kinds of analyses as well as different spatial scales. Here, we test if changing the spatial scale of analysis can affect the detection of a relationship between hantavirus infection prevalence and rodent species richness throughout the World. We found that these relationships are always negative, whatever the spatial scale. Nevertheless, the dilution effect magnitude decreases if larger spatial scales are considered. These results, which remain consistent for all regions, highlight that the dilution effect should be a general phenomenon for hantaviruses, but that its detection can be hampered by the spatial scale considered. Finally, we discuss the mechanisms that can hinder the observation of a dilution effect and the necessity to consider other host-pathogen systems.

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