

# Models suggest little brown bats more susceptible to fungus than bigger bats

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Big eared townsend bat (*Corynorhinus townsendii*) Credit: Public Domain

(Phys.org)—A team of researchers with members from several institutions in New Zealand and the U.S. has found, via modeling, that little brown bats in North America are likely more susceptible to dying due to a certain fungal infection than bigger brown bats, due to their size and habitat. The team has published their results in the journal *Science*

*Advances.*

Scientists and environmentalists alike have become concerned as the number of little brown bats in North America dying due to a [fungal infection](#) known as white-nose syndrome, has climbed into the millions. The fungus attacks the facial skin while the bats are hibernating, causing them to wake from hibernation early—that in turn causes them to die from exposure due to early expenditure of energy reserves. Prior studies have shown that other bats in North America and Europe are not harmed by the fungus and that has led to this newest effort to find out why there is such a stark difference between species.

To learn more, the researchers conducted simulations to better understand the conditions that lead to fungal growth and then developed models based on the simulations they ran. Next they built models that mimicked the [energy requirements](#) of hibernating bats, taking into account the energy needs for the little brown bats, big brown bats, and also their European cousins, serotine and greater mouse-eared bats. They also noted that [white-nose syndrome](#) is relatively new to North America—prior studies have indicated the fungus migrated from Europe.

In studying the results offered by all of the models, the researchers found that the energy requirements of hibernating bats varied by species as did metabolic rates, and that both were related to size. They also found that the fungus showed faster growth in areas of high humidity. The team also noted that the little brown bats, besides being smaller than all the others under study, also tended to hibernate in more humid parts of the country.

Taken together, the data from the models suggests that it is likely the reason that little [brown bats](#) are more susceptible to dying from the fungus is because of their smaller size and because they hibernate in

areas where the fungus grows faster. The team also suggests that European bats may have evolved traits that help them fight off the [fungus](#)—over their much longer history with the disease.

**More information:** D. T. S. Hayman et al. Environment, host, and fungal traits predict continental-scale white-nose syndrome in bats, *Science Advances* (2016). [DOI: 10.1126/sciadv.1500831](https://doi.org/10.1126/sciadv.1500831)

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