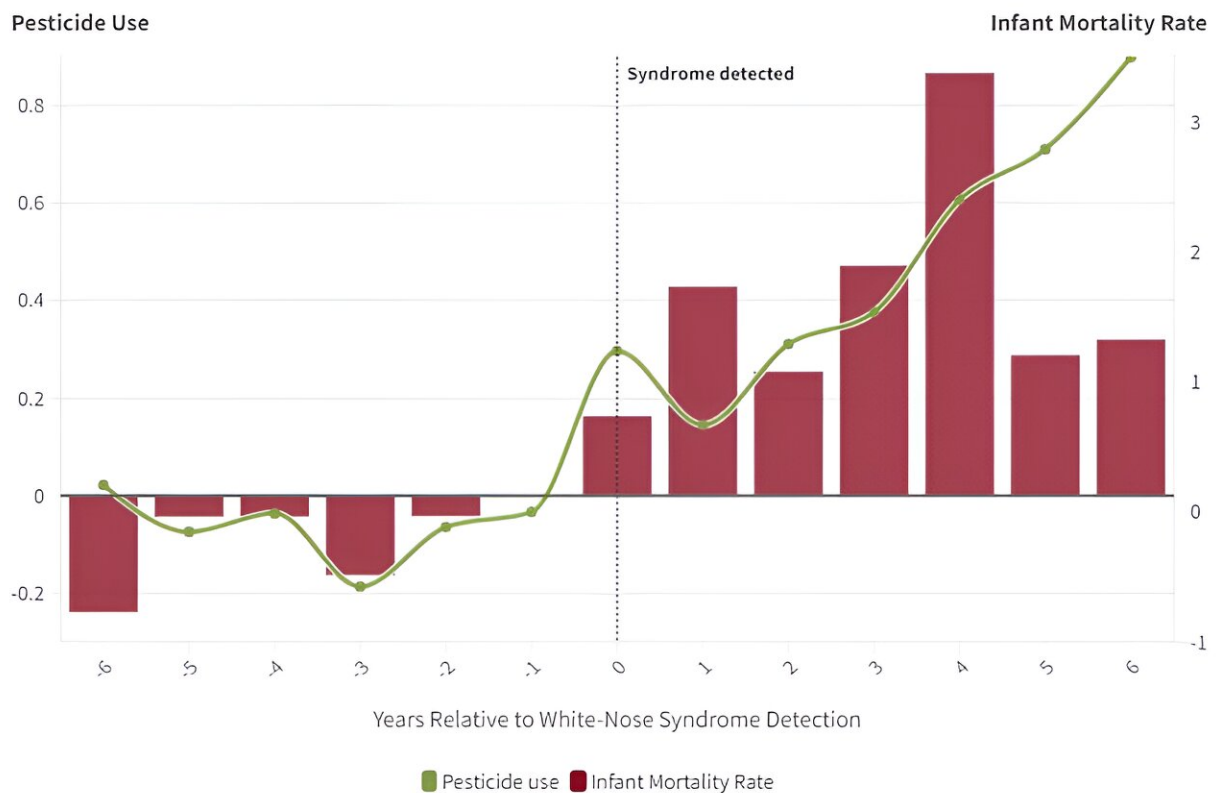


Bat population collapse linked to increased pesticide use and more than 1,000 infant deaths

September 5 2024



Source: The Economic Impacts of Ecosystem Disruptions: Costs from Substituting Biological Pest Control, Science, September 2024

The study compared the effect of bat die-offs from White-Nose Syndrome on pesticide use in counties that experienced bat population declines to counties that were likely unaffected. It found that when the bat populations declined, farmers increased their use of pesticides by about 31 percent. When farmers increased their use of pesticides, the infant mortality rate—a common marker to study the

health impacts of environmental pollution—rose by almost 8 percent. This corresponds to an additional more than 1,000 infant deaths. Credit: Energy Policy Institute at the University of Chicago, epic.uchicago.edu

Bats are considered a natural pesticide, widely relied on by farmers as an alternative to chemical pesticides to protect their crops from insects. But since 2006, many bat populations have collapsed in counties in North America due to an invasive fungus found in the caves bats use during the day and throughout winter that causes what is known as White-Nose Syndrome.

A study in *Science* uses their sudden collapse [to explore](#) whether farmers turned to [chemical pesticides](#), and whether doing so impacts [human health](#). It finds that farmers did increase their pesticide use, leading to more than 1,000 infant deaths.

"Bats have gained a bad reputation as being something to fear, especially after reports of a possible linkage with the origins [of] COVID-19," says study author Eyal Frank, an assistant professor at the Harris School of Public Policy. "But bats do add value to society in their role as natural pesticides, and this study shows that their decline can be harmful to humans."

Frank compared the effect of bat die-offs on [pesticide use](#) in counties that experienced those bat population declines to counties that were likely unaffected by the wildlife disease.

He found that when the bat populations declined, farmers increased their use of pesticides by about 31%. Because pesticides have been linked to negative health impacts, Frank next tested to see if the increased use of pesticides corresponded with an increase in infant mortality—a common

marker to study the health impacts of environmental pollution.

Indeed, when farmers increased their use of pesticides, the infant mortality rate rose by almost 8%. This corresponds to an additional 1,334 infant deaths. Or, for every 1% increase in pesticides, there was a 0.25% increase in the infant mortality rate.

The study also found that pesticides aren't as good at preventing pests as bats. The quality of the crops likely declined, as farmers' revenue from crop sales decreased by nearly 29%. Combining this revenue loss with the expense of the pesticides, [farmers](#) in communities that experienced the bat die-offs lost \$26.9 billion dollars between 2006 and 2017. Adding to those losses, the \$12.4 billion in damages from [infant mortality](#), the total societal cost from the bat die-offs in these communities amounted to \$39.6 billion.

"When bats are no longer there to do their job in controlling insects, the costs to society are very large—but the cost of conserving [bat populations](#) is likely smaller," says Frank.

"More broadly, this study shows that wildlife adds value to society, and we need to better understand that value in order to inform policies to protect them."

More information: Eyal G. Frank, The economic impacts of ecosystem disruptions: Costs from substituting biological pest control, *Science* (2024). [DOI: 10.1126/science.adg0344](https://doi.org/10.1126/science.adg0344).
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Provided by University of Chicago

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