

Deforestation, forest conversion and palm oil plantations linked to disease outbreaks

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Deforestation, certain types of reforestation and commercial palm plantations correlate with increasing outbreaks of infectious disease, shows a new study in *Frontiers in Veterinary Science*. This study offers a

first global look at how changes in forest cover potentially contribute to vector-borne diseases—such as those carried by mosquitos and ticks—as well as zoonotic diseases, like COVID-19, which jumped from an animal species into humans. The expansion of palm oil plantations in particular corresponded to significant rises in vector-borne disease infections.

"We don't yet know the precise ecological mechanisms at play, but we hypothesize that plantations, such as oil palm, develop at the expense of natural wooded areas, and reforestation is mainly monospecific [forest](#) made at the expense of grasslands," says lead author Dr. Serge Morand, who has joint positions at the Centre National de la Recherche Scientifique (CNRS) in France and Kasetsart University in Thailand. "Both land use changes are characterized by loss of biodiversity and these simplified habitats favor animal reservoirs and vectors of diseases."

Land use and disease outbreaks

Deforestation is widely recognized to negatively impact biodiversity, the climate and human health generally. Deforestation in Brazil has already been linked to [malaria epidemics](#), but the global consequences of deforestation and forest cover changes on human health and epidemics has not been studied in detail.

To better understand these effects, Morand and his colleague looked at changes in [forest cover](#) around the world between 1990 and 2016. They then compared these results to the local population densities and outbreaks of vector-borne and [zoonotic diseases](#). They also specifically looked at reforestation and afforestation—which included conversion of natural grasslands and abandonment of agricultural land. Several prior studies had claimed that both afforestation and palm oil plantations likely play a role in further spreading disease vectors.

Confirming past hypotheses, they found that both deforestation and afforestation had significant correlations to disease outbreaks. They found a strong association between deforestation and epidemics (such as malaria and Ebola) in [tropical countries](#) like Brazil, Peru, Bolivia, the Democratic Republic of Congo, Cameroon, Indonesia, Myanmar and Malaysia. In contrast, [temperate regions](#) like the U.S., China and Europe showed clear links between afforestation activities and vector-borne diseases like Lyme disease.

Their approach did not distinguish between different types of reforestation activities, but they did find a significant increase in disease outbreaks in countries with expanding palm oil plantations. This was especially striking in regions of China and Thailand, where there was relatively little [deforestation](#). These areas appeared particularly susceptible to mosquito-borne diseases like dengue, zika and yellow fever.

Healthy forests for a healthy planet

These results suggest that careful forest management is a critical component in preventing future epidemics. Commercial plantations, land abandonment, and grassland conversion to forests are potentially detrimental and these are no substitute for preserving the world's existing forests.

"We hope that these results will help policymakers recognize that forests contribute to a healthy planet and people, and that governing bodies need to avoid afforestation and agricultural conversion of grasslands," says Morand. "We'd also like to encourage research into how healthy forests regulate diseases, which may help better manage forested and planted areas by considering their multidimensional values for local communities, conservation and mitigation of climate change."

More information: Serge Morand et al, Outbreaks of Vector-Borne and Zoonotic Diseases Are Associated With Changes in Forest Cover and Oil Palm Expansion at Global Scale, *Frontiers in Veterinary Science* (2021). [DOI: 10.3389/fvets.2021.661063](https://doi.org/10.3389/fvets.2021.661063)

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