
Massive yet massively underestimated global costs of invasive insects

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Abstract

Insects have presented human society with some of its greatest development challenges for millennia by spreading diseases, consuming crops and damaging infrastructure. Despite the massive human and financial toll of invasive insects, cost estimates remain sporadic, spatially incomplete and of questionable reliability. We constructed the most comprehensive database of economic costs for invasive insects ever compiled, expressing historical estimates in annual 2014-equivalent US dollars. Including all reported goods and services estimates, invasive insects cost US\$70.0 billion year⁻¹ globally, and global health costs directly attributable to invasive insects exceed US\$6.9 billion year⁻¹. Total costs rise as the number of estimates increases, such that there is an order of magnitude increase for an additional 5-19 estimates per region of the world. Because there are still very few studies, this implies that costs are grossly underestimated at a global scale. Global warming as a consequence of climate change, rising human population densities and intensifying international trade will potentially allow the costliest insects to spread into new areas, although substantial savings could be achieved by increasing surveillance, containment and public awareness.

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Keywords: invasive species, insects, economic cost