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Climate and container breeding mosquitoes: a perfect storm in a changing world

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Several mosquitoes of medical importance are known to be adept at exploiting human habitat, and adapting to urban environments to breed, feed, and transmit pathogens that affect humans. Historically, *Aedes aegypti* spread from the old to new world, and rapidly became a primary vector in the Americas, for viruses such as yellow fever, dengue, and more recently, chikungunya and Zika. *Aedes albopictus* appears to have become established in the United States following an introduction event along the gulf coast in the past few decades, providing another, perhaps less efficient, but more cold-tolerant vector for the same arboviral diseases as *Ae aegypti*. In the past few years, the world has been made aware of *Anopheles stephensi*, a malaria vector originally found in the subcontinent of India and through parts of the Middle East, but a form of this mosquito has adapted to become anthropophilic, urban-friendly, and has spread across Africa as far as Ghana. Using thermal suitability models for transmission of arboviruses and malarias by these urban-friendly container breeders, we mapped baseline and future potential climate induced range shifts, and estimated how many people in the Americas were at risk for one or more of these, and for how many months of the year. This provides an outer envelope of thermal suitability risk for transmission, without any assumptions about responses to precipitation patterns, as human water storage behavior in the form of containers, irrigation (agricultural and domestic), ornamental plantings, or pooled water in abandoned lots, can obscure the signal.

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