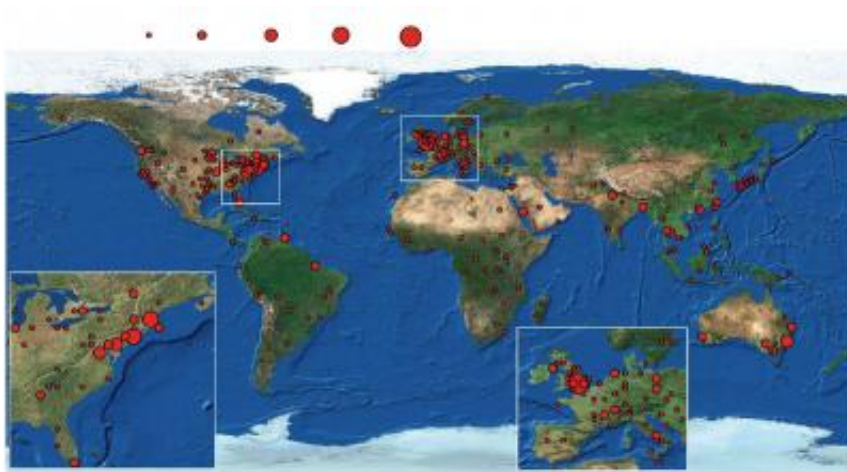


Emerging infectious diseases on the rise: Next target 'hotspot' predicted

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Global richness map of the geographic origins of EID events from 1940 to 2004. The map is derived for EID events caused by all pathogen types. Circles represent one degree grid cells, and the area of the circle is proportional to the number of events in the cell. Credit: Jones et. al., *Nature*

It's not just your imagination. Providing the first-ever definitive proof, a team of scientists has shown that emerging infectious diseases such as HIV, Severe Acute Respiratory Syndrome (SARS), West Nile virus and Ebola are indeed on the rise. The team – including University of Georgia professor John Gittleman and scientists from the Consortium for Conservation Medicine, the Institute of Zoology (London) and Columbia University – recently published their findings in leading scientific journal *Nature*.

By analyzing 335 incidents of previous disease emergence beginning in 1940, the study has determined that zoonoses – diseases that originate in animals – are the current and most important threat in causing new diseases to emerge. And most of these, including SARS and the Ebola virus, originated in wildlife. Antibiotic drug resistance has been cited as another culprit, leading to diseases such as extremely drug-resistant tuberculosis (XDR TB).

The scientists also found that more new diseases emerged in the 1980s than any other decade, “likely due to the HIV/AIDS pandemic, which led to a range of other new diseases in people,” said Mark Levy, deputy director of the Center for International Earth Science Information Network (CIESN) at Columbia University.

But this team did not stop with determining the causes and origins of emerging infectious diseases; they took it a step further. To help predict and prevent future attacks, sophisticated computer models were used to help design a global map of emerging disease hotspots.

“This is a seminal moment in how we study emerging diseases,” said Gittleman, dean of the Odum School of Ecology, who developed the approach used in analyzing the global database. “Our study has shown that bringing ecological sciences and public health together can advance the field in a dramatic way.”

Over the last three decades, billions of research dollars were unsuccessfully spent to try to explain the seemingly random patterns of infectious disease emergence and spread. Finally, this research gives the first insight about where future outbreaks may occur – and next up is likely the Tropics, a region rich in wildlife species and under increasing human pressure.

“Emerging disease hotspots are more common in areas rich in wildlife,

so protecting these regions from development may have added value in preventing future disease emergence,” said Kate Jones, Senior Research Fellow of the Institute of Zoology.

Emerging diseases have caused devastating effects internationally, with millions infected and billions spent. Some diseases have become pandemic, spreading from one continent to another causing massive mortality rates and affecting global economies and livelihoods.

“This work by John and his collaborators is absolutely first rate, as evidenced by its publication in one of the world’s foremost scientific journals,” said UGA Vice President for Research David Lee. “It brings novel insights and perspective to the fight against global diseases and illustrates the tremendous potential of this new field of disease ecology. It is vital that we better understand how environmental factors, including man’s activities, affect the spread of infectious diseases.”

But knowing where the next outbreak is and understanding the reason for its occurrence does not alleviate the entire issue.

“The problem is, most of our resources are focused on the richer countries in the North that can afford surveillance – this is basically a misallocation of global health funding and our priority should be to set up ‘smart surveillance’ measures in these hotspots, most of which are in developing countries,” said Peter Daszak, executive director of the Consortium for Conservation Medicine. “If we continue to ignore this important preventative measure then human populations will continue to be at risk from pandemic diseases.”

Source: University of Georgia

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