



ID 2469. Assessing the risk of diseases with epidemic and pandemic potential in a changing world

Angela Fanelli¹, Emanuele Massaro³, Alessandro Cescatti³, Juan Carlos Ciscar², Gregoire Dubois⁴, Dolores Ibarreta², Marine Robuchon⁴, Wojtek Szewczyk².

1. European Commission, Joint Research Centre (JRC) Scientific Development Programmes Unit, Ispra, Italy
2. European Commission, Joint Research Centre (JRC) Economics of Climate Change, Energy and Transport Unit, Seville, Spain
3. European Commission, Joint Research Centre (JRC) Forests and Bio-Economy Unit, Ispra, Italy
4. European Commission, Joint Research Centre (JRC) Nature Conservation and Observations Unit, Ispra, Italy

Tipo de comunicación/Type of communication: Oral

Afiliación/Affiliation: 1. European Commission, Joint Research Centre (JRC) Scientific Development Programmes Unit, Ispra, Italy
2. European Commission, Joint Research Centre (JRC) Economics of Climate Change, Energy and Transport Unit, Seville, Spain

Introducción y Objetivo/Background and objectives

Anthropogenic changes disrupt the balance of wildlife, livestock, and human populations, increasing the risk of zoonotic spillover events. This study aims to understand how climate, environment, and human activity contribute to the emergence of infectious diseases using advanced statistical methods and multiple data sources.

Métodos/Methods

We assessed the risk of the WHO priority diseases with epidemic and pandemic potential in humans by deriving drivers from multiple sources and constructing a spatial Bayesian Additive Regression Trees (BART) model using data from 1975 to 2020. We also developed an epidemic risk index that assesses not only a country's potential for zoonotic outbreak occurrence but also its capacity to respond.

Resultados/Results

The results indicate that 11.5% of the world is at high (8.8%) or very high (2.7%) risk of disease outbreaks with epidemic and pandemic potential, with most of those areas located in Asia, Africa, and South America. Rapid changes in population density significantly contribute to the escalating risk of outbreaks. Additionally, the levels of annual precipitation, livestock density and land use change exhibit a positive correlation, indicating a higher risk of an outbreak at higher values. We also found that low values of human-forest proximity are linked with a higher risk of outbreaks. This means that as people get closer to forested areas, the risk of disease outbreaks rises. Finally, the epidemic risk index showed that high potential risk does not always translate to high actual risk where response capabilities are robust.

Conclusión y Relevancia/Conclusions and relevance

Our study provides valuable insights for policy considerations, encompassing a spectrum of interconnected areas. The understanding of the impact of disease-shared risk factors on the occurrence of outbreaks of diseases with epidemic and pandemic potential can improve decision-making and strengthen the strategies used to prevent future disease outbreaks.