Global Epidemiology Landscapes of Talaromyces Marneffei: A systematic review of individual case data

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Objective

We aim to characterize the global epidemiology landscapes caused by Talaromy -ces marneffei (TM), based on global individual cases reports from 1956 to 2016, and to explore the potential factors associated with TM infection.

Methods

Data on laboratory-confirmed cases of Talaromyces Marneffei contained in Wanfang, CNKI, PubMed and web of Science was analyzed. We described the epidemiological characteristics across epidemics and trends of TM infection with global HIV-infected prevalence. Ecological model was used to estimate the potential prevalence regions of TM, meanwhile, we used jackknife test to explore factors that affect TM distribution.

Results

1.Characteristic of TM Cases Report

The demographic data and clinical features that have been reported from 670 published articles, between 1956 and 2017, were collected in study. A total of 21, 833 TM reported cases contributed data during our research period. TM prevalence of China Vietnam and Thailand was 4.12% (95% CI: 4.05%-4.19%), 5.72% (95% CI: 5.09%-6.34%) and 2.89% (95% CI: 2.83%-2.96%). The combined TM prevalence was 3.42% (95% CI: 3.38%-3.46%).

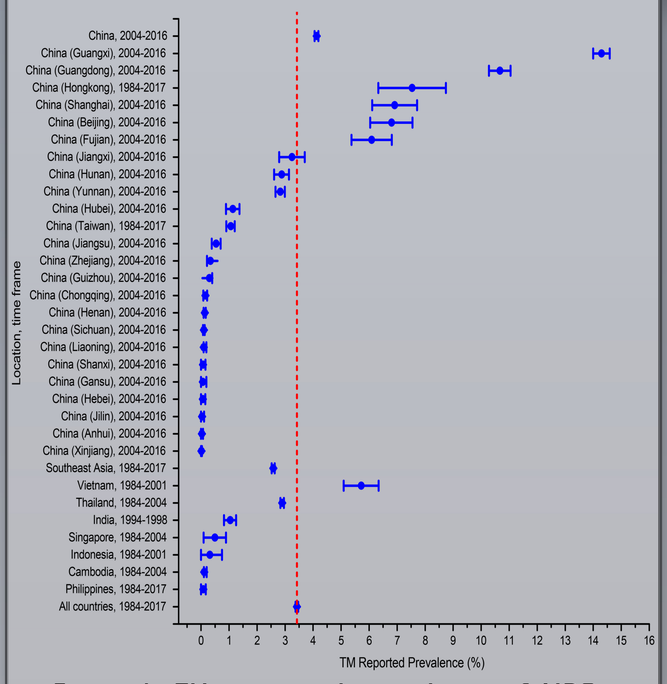


Figure 1. TM estimated prevalence of AIDS populations from 1985 to 2015.

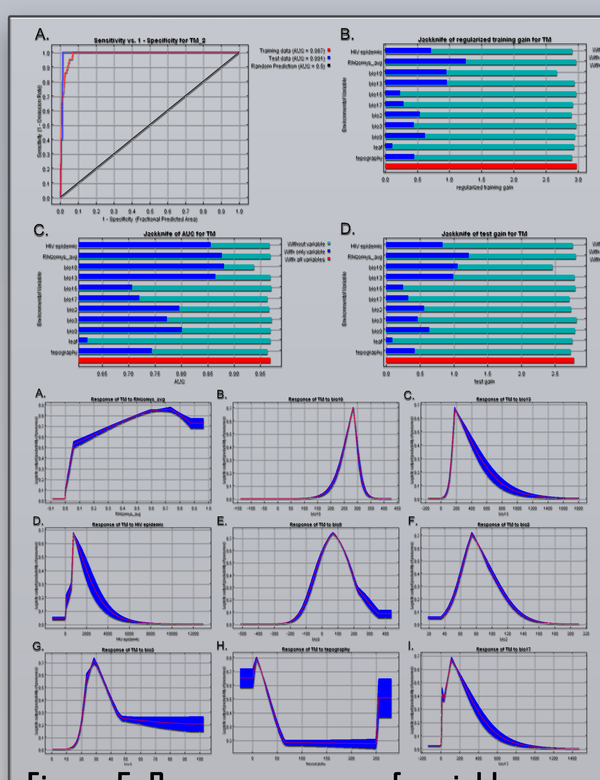


Figure 5. Response curves of variables associated with TM

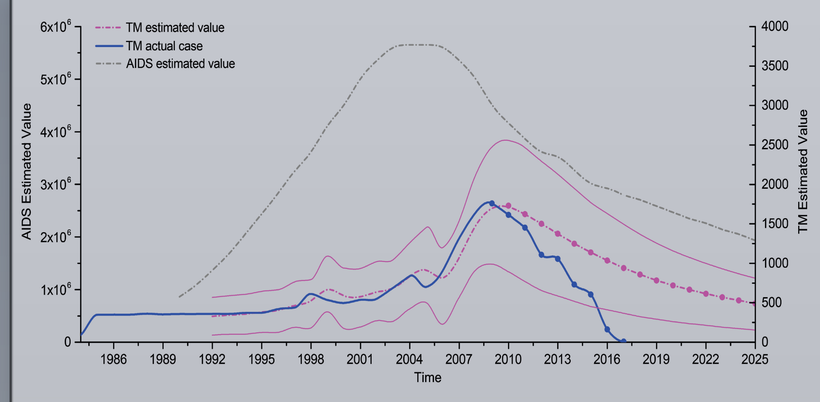
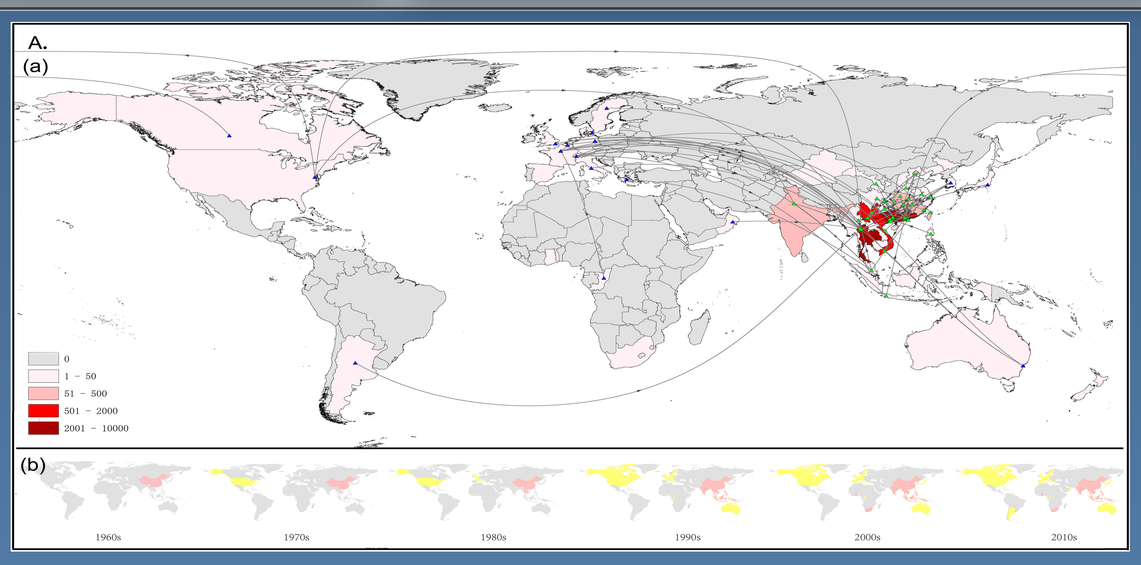


Figure 2. Global AIDS prevalence and TM cases report from 1980s to 2017, and estimated TM cases after 2009.

2.The Time Series Analysis

Global TM reported cases increased from 1984 to 2009, and subsequently fell after 2010; The time series forecasting results showed that TM reported cases will decrease between 2009 and 2025,from 1773 to 500. And there were about 4000 unrepor -ted TM cases between 2010 and 2017; It show strong concordance between global HIV prevalence and TM cases report from 1960s to 2009 (correlation coefficient equals 0.986).



3.Geographical Analysis of TM Prevalence

TM cases have been reported in 33 countries between 1960s and 2010s. The number of reported countries has increased during this periods, with expan -sion from East Asia in 1960s to North America in 1970s, then Southeast Asia and Europe in 1980s, South Asia in 1990s, Africa in 2000s, South America, West Asia and Oceania in 2010s.

The input cases were first reported in America by travelling in Southeast Aisa,then expanded to Europe, South America, West Aisa and Oceania. 16 countries including China, Thailand, Vietnam, Malaysia, Indonesia, and so on were the nations where the input TM patiens had traveled. China, Thailand, Vietnam were the primary traveled countries.

4.The Potential Prevalence Regions of TM

The results of model indicated that Southern China, Southeast Asia, Central America, West coast of Africa, Southeastern coast of Africa, Eastern coast of South America, Northern India, Eastern coast of India, Eastern coast of Australia, the Korean peninsula, Japan, and Madagascar were the potential prevalence regions of TM

5.Potential Factors Affecting TM Distribution

Jackknife test showed that distribution of Rhizomys distribution, mean temperature of warmest quarter, precipitation of wettest month, HIV epidemic and mean temperature of driest quarter were the top 5 important variables for TM potential prevalence.

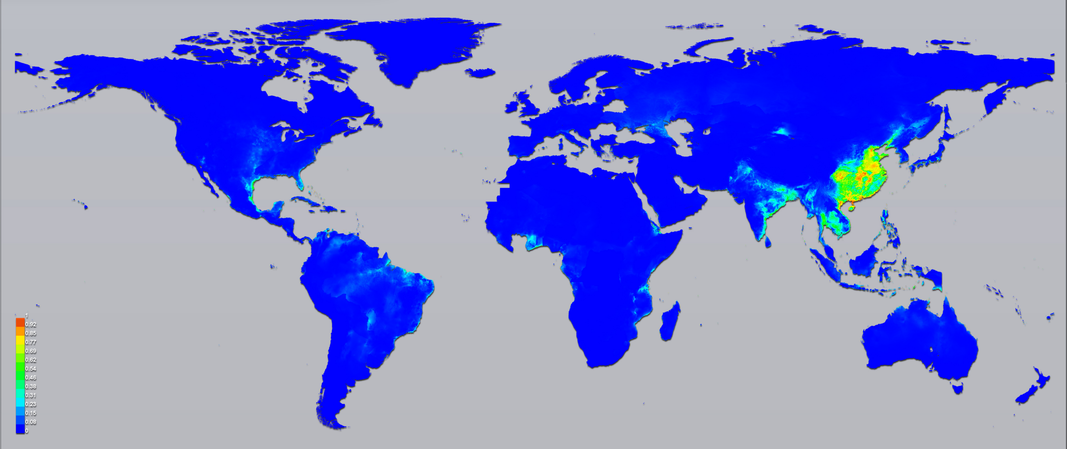


Figure 4. TM potential prevalence predicted by maxent model

Conclusions

During the past four decades, TM infection has increased rapidly due to the prevalence of HIV, which has caused large disease burden. More seriously, case reports only represent the “tip of the iceberg” of the epidemic, specific monitoring systems should be set up. In summary, more attention should be pay for TM infection.

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