



长春理工大学数学与统计学院 系列学术报告

The Influence of Ambient Air Pollution on the Transmission of Tuberculosis--A Case Study in Jiangsu, China

报 告 人：王玮明 教授（淮阴师范学院）

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Abstract: In this paper, based on the statistical data, we investigate the effects of long-term exposure to ambient particulate air pollution on the transmission dynamics of tuberculosis (TB) in Jiangsu, China by studying the threshold dynamics of the TB epidemic model via the statistical data analytically and numerically. The basic reproduction number $R_0 > 1$ reveals that TB in Jiangsu, China is an endemic disease and will persist for a long time. And the numerical results show that, in order to control the TB in Jiangsu effectively, we must decrease the depuration coefficient of PM_{10} in the body, the proportion of TB symptomatic infectious by direct transmission, the reactivation rate of the pre-symptomatic infectious and the effect coefficient of PM_{10} and MTB inhaled of TB transmission, and increase the uptake coefficient, the recovery rate of the symptomatic/pre-symptomatic infectious and the influence coefficient of PM_{10} on the body of mortality. Our study shows that PM_{10} is closely related to the incidence of TB, and the effective control efforts are suggested to focus on increasing close-contact distance and wearing protective mask to decrease the influence of PM_{10} on the TB transmission, which may shed a new light on understanding the environmental drivers to TB.

报告人简介：淮阴师范学院“翔宇学者”、数学与统计学院教授，陕西师范大学兼职博导；中国数学会生物数学专委会常务理事、副秘书长；中国工业与应用数学会数学与生命科学专委会理事。江苏省十四五“数学”重点学科带头人；江苏省高校科技创新团队“传染病防控的建模分析及预警系统”带头人；淮安市传染病防控及预警重点实验室主任。曾入选浙江省“新世纪 151 人才工程”第二层次，担任浙江省十二五“应用数学”重点学科带头人。近十年来专注于传染病防控的建模分析及预警研究，得到了国家自然科学基金的连续资助，已主持完成面上项目 2 项，目前主持在研 1 项。在科学出版社出版专著 2 部。近五年来，获中国产学研合作与创新成果奖优秀奖、海南省自然科学奖二等奖和新疆自治区科技进步奖二等奖各 1 项。入选爱思唯尔 2020、2021、2022 “中国高被引学者”以及科睿唯安 2021、2022 “全球高被引科学家”等榜单。

主办单位：数学与统计学院 数学与工程科学交叉研究中心
科学技术研究院 研究生院