

Developing a Machine Learning System for Identification of Severe Hand, Foot, and Mouth Disease from Electronic Medical Record Data

Guangjian Liu^{1, †}, Yi Xu^{2, †}, Xinming Wang^{3, †}, Xutian Zhuang³, Huiying Liang¹, Yun Xi³, Fangqin Lin¹, Liyan Pan¹, Taishan Zeng⁴, Huixian Li¹, Xiaojun Cao⁵, Gansen Zhao^{3,*}, Huimin Xia^{6,*}

¹Institute of Pediatrics, Guangzhou Women and Children's Medical Center, Guangzhou Medical University, Guangzhou, China;

²Department of Infectious Diseases, Guangzhou Women and Children's Medical Center, Guangzhou Medical University, Guangzhou, China;

³School of Computer, South China Normal University, Guangzhou, China;

⁴School of Mathematical Sciences, South China Normal University, Guangzhou, China;

⁵Department of Research, Education and Data Management, Guangzhou Women and Children's Medical Center, Guangzhou Medical University, Guangzhou, China;

⁶Department of Pediatric Surgery, Guangzhou Women and Children's Medical Center, Guangzhou Medical University, Guangzhou, China.

† Guangjian Liu, Yi Xu, and Xinming Wang contributed equally to this work.

*Corresponding Authors:

Gansen Zhao, School of Computer, South China Normal University, 55 Zhongshan Road West, Guangzhou, China (gzhao@m.scnu.edu.cn);

Huimin Xia, Guangzhou Women and Children's Medical Center, 9 Jinsui Road, Guangzhou 510623, China (xia-huimin@foxmail.com).

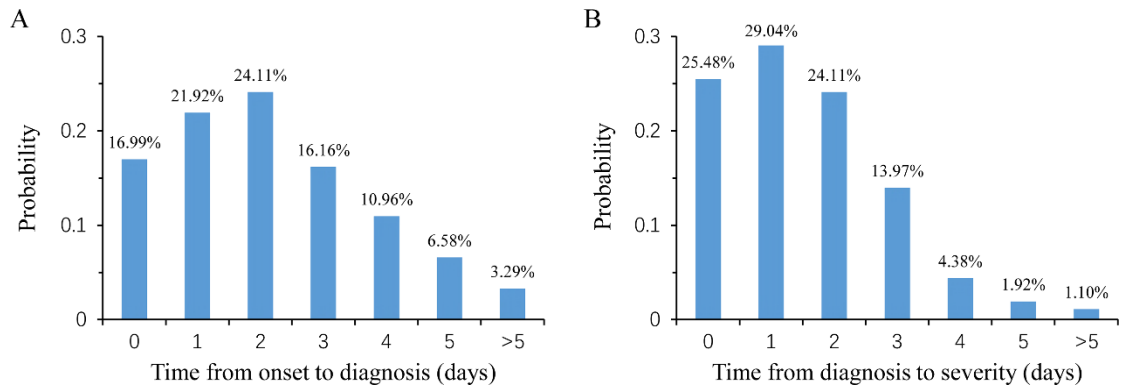


Figure S1 Distributions of onset-to-diagnosis (A) and diagnosis-to-severity (B) time interval of severe cases (n=365) of hand, foot, and mouth disease.

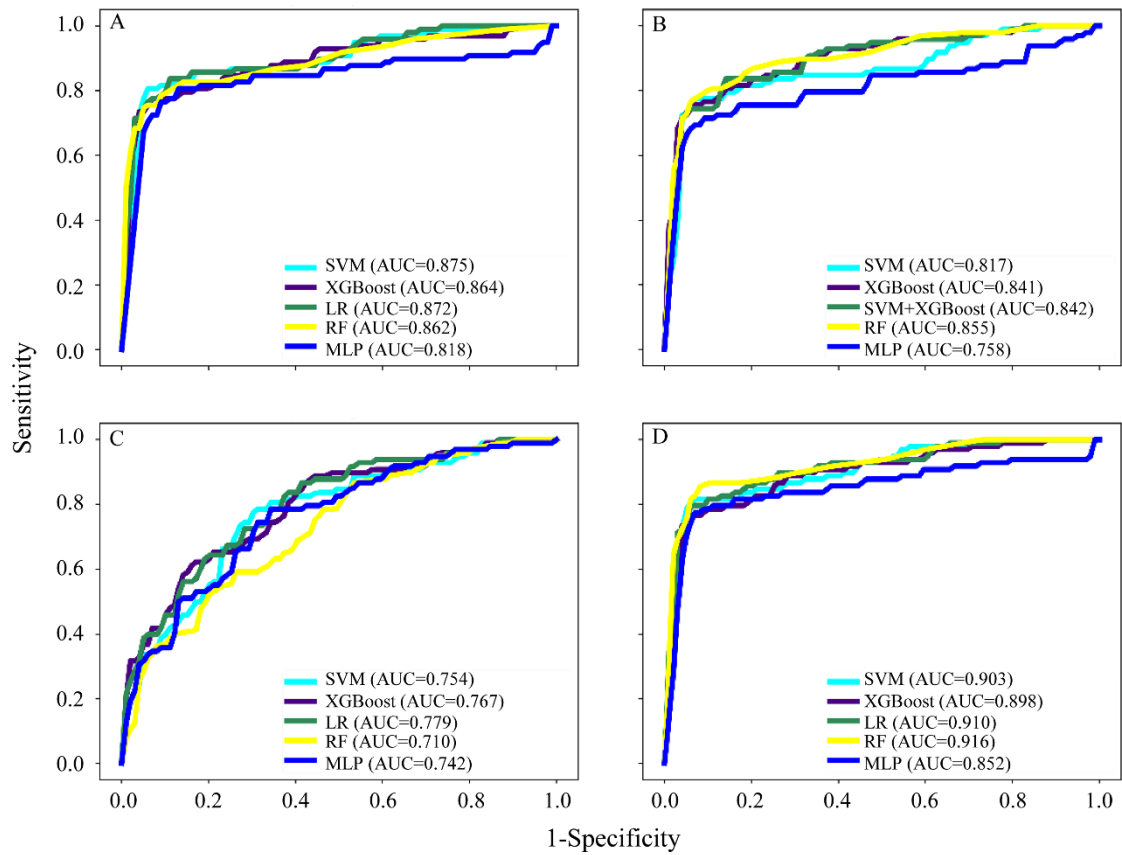


Figure S2 The receiver operating characteristic curves with five machine learning algorithms for all the 153 variables (A), 11 structured variables (B), 5 unstructured variables (C) and 16 structured and unstructured variables (D). SVM, Support Vector Machine; LR, Logistic Regression; RF, Random Forest; MLP, Multi-Layer Perceptrons.