

five. These data suggest clonal spread of these two clones, which needs to be closely monitored in the future.

Our data demonstrate the high prevalence of extended-spectrum β -lactamase-producing isolates and wide dissemination of CPE among bloodstream infection isolates in China. Since China has developed the national antimicrobial resistance surveillance network⁵ and has committed to combatting antimicrobial resistance, we must also ensure that the financial support from the government continues to grow by emphasising the importance of CRE to public health.

We declare no competing interests.

Beiwen Zheng, Yunbo Chen,
Laurencia Violetta, *Yonghong Xiao,
Lanjuan Li
xiaoyonghong@zju.edu.cn

Collaborative Innovation Center for Diagnosis and Treatment of Infectious Diseases, State Key Laboratory for Diagnosis and Treatment of Infectious Diseases, The First Affiliated Hospital, College of Medicine, Zhejiang University, Hangzhou, China.

This study was funded in part by grants from the National Key Research and Development Program of China (2017YFC1200203 and 2016YFD0501105), the National Natural Science Foundation of China (81741098 and 81711530049), the Mega-projects of Science Research of China (2018ZX10733402-004 and 2018ZX10712001-005), the Zhejiang Provincial Key Research and Development Program (2015C03032), and the Zhejiang Provincial Natural Science Foundation of China (LY17H190003).

- 1 Stewardson AJ, Marimuthu K, Sengupta S, et al. Effect of carbapenem resistance on outcomes of bloodstream infection caused by Enterobacteriaceae in low-income and middle-income countries (PANORAMA): a multinational prospective cohort study. *Lancet Infect Dis* 2019; **19**: 601–10.
- 2 Xiao Y, Li L. China's national plan to combat antimicrobial resistance. *Lancet Infect Dis* 2016; **16**: 1216–18.
- 3 Lim C, Takahashi E, Hongsuwan M, et al. Epidemiology and burden of multidrug-resistant bacterial infection in a developing country. *Elife* 2016; **5**: e18082.
- 4 Correa L, Martino MD, Siqueira I, et al. A hospital-based matched case-control study to identify clinical outcome and risk factors associated with carbapenem-resistant *Klebsiella pneumoniae* infection. *BMC Infect Dis* 2013; **13**: 80.
- 5 Xiao YH, Giske CG, Wei ZQ, Shen P, Heddi A, Li LJ. Epidemiology and characteristics of antimicrobial resistance in China. *Drug Resist Updat* 2011; **14**: 236–50.

The need for adequate research data on carbapenem use and resistance in Bangladesh

We read with interest the Article by Andrew Stewardson and colleagues,¹ which showed that carbapenem-resistant Enterobacteriaceae (CRE) bloodstream infections cause extended durations of hospital stay and increased mortality in patients in low-income and middle-income countries, including Bangladesh.

Enterobacteriaceae is a broad family of Gram-negative bacteria, with *Escherichia coli*, *Klebsiella* spp, and *Enterobacter* spp as the most common pathogens that cause both community-associated and health care-associated infections. Antibiotic resistance is considered one of the most pressing issues in the global health-care sector and CRE is a rising global problem.¹ As van Duin and Doi² discussed in their review, carbapenem resistance mediated by *Klebsiella pneumoniae* carbapenemase (KPC)-producing *K pneumoniae* and the New Delhi metallo- β -lactamase is prevalent in south Asian countries, including Bangladesh.

The PANORAMA study considered data from tertiary-level hospitals in two low-income countries in south Asia (Bangladesh and Nepal), and effectively documented the increased mortality risk and prolonged hospital stay associated with CRE infections. However, this study only briefly mentioned the major social and health-care problems responsible for the alarmingly high CRE prevalence in Bangladesh, which include inadequate infection control initiatives, inadequate antimicrobial stewardship activities in the health-care sector, a culture of self-medication, and overuse of antibiotics in food production.¹ Ahmed and colleagues³ highlighted current antibiotic resistance scenarios in Bangladesh; importantly, this

study found that inadequate surveillance data on antimicrobial resistance from 58 of the 64 districts of Bangladesh cannot accurately represent the country's current situation with regard to antimicrobial resistance. Studies have shown that in Bangladesh, 83% of prescriptions made in the community setting have no clinical justification for prescribing an antibiotic,⁴ and in many cases physicians irrationally prescribe antibiotics to their patients without following any recommended guideline.⁴ Unfortunately, studies have rarely focused on the use of carbapenems and their resistance mechanisms in Bangladesh.^{3,4}

Research activities are required to justify the use of carbapenems and outcomes associated with CRE infections in Bangladesh. There is a huge unmet need for these aforementioned data as stakeholders are unable to take necessary actions without dependable research or surveillance data. Concerted efforts must therefore be made towards research to yield a data archive of actual carbapenem use and CRE prevalence in Bangladesh, and to establish a national antimicrobial resistance surveillance network.

We declare no competing interests.

*Md Jahidul Hasan, Raihan Rabbani
jahidul@squarehospital.com

Clinical Pharmacy Services (MJH), and Internal Medicine and ICU, Medical Services (RR), Square Hospitals, West Panthapath, Dhaka 1205, Bangladesh

- 1 Stewardson AJ, Marimuthu K, Sengupta S, et al. Effect of carbapenem resistance on outcomes of bloodstream infection caused by Enterobacteriaceae in low-income and middle-income countries (PANORAMA): a multinational prospective cohort study. *Lancet Infect Dis* 2019; **19**: 601–10.
- 2 van Duin D, Doi Y. The global epidemiology of carbapenemase-producing Enterobacteriaceae. *Virulence* 2017; **8**: 460–69.
- 3 Ahmed I, Rabbi MB, Sultana S. Antibiotic resistance in Bangladesh: a systematic review. *Int J Infect Dis* 2019; **80**: 54–61.
- 4 Biswas M, Roy DN, Tajmim A, et al. Prescription antibiotics for outpatients in Bangladesh: a cross-sectional health survey in three cities. *Ann Clin Microbiol Antimicrob* 2014; **13**: 15.