

P2443 **Activity of ertapenem through 15 years of SMART global surveillance**

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Background: According to the WHO, antimicrobial resistance is an increasingly serious threat to global public health that requires action across all government sectors and society. To understand and combat antimicrobial resistance and to make informed empiric therapy decisions, ongoing surveillance is strongly encouraged by federal governments, antimicrobial stewardship bodies, and clinicians. The SMART global surveillance program was established in 2002 to monitor *in vitro* antimicrobial susceptibility profiles of clinical isolates of gram-negative bacilli (GNB).

Materials/methods: Hospitals annually collected up to 100 GNB from intra-abdominal infections (IAI) starting in 2002, up to 50 isolates from urinary tract (UTI) since late 2009, and up to 100 isolates from lower respiratory tract infections (RTI) since 2015. MICs were determined for 249,249 GNB using CLSI broth microdilution. The % susceptible was assessed using CLSI breakpoints.

Results: Between 2002 and 2016, 207,347 *Enterobacteriaceae* isolates (83.2% of all GNB) were collected by 331 hospitals in 59 countries. On a yearly basis, the number of participating countries increased from 18 in 2002 to 53 in 2016. Susceptibility to ertapenem at 3 time points is shown below.

	% Ertapenem-susceptible (total n)		
	2002	2010	2016
All sources ^a	96.5 (2569)	96.0 (17390)	92.5 (29481)
IAI	96.5 (2563)	95.8 (10688)	93.2 (12897)
UTI	NA	96.5 (6561)	94.1 (8270)
RTI	NA	NA	89.6 (8051)

^a Includes isolates for which the infection source was not specified. NA, not available

Over the time period studied, susceptibility rates to ertapenem remained relatively constant and high. In comparison, but not shown in the table, susceptibility to cefepime decreased from 91.8 to 74.7% and from 91.7 to 76.8% in isolates from all sources and IAI, respectively; to ciprofloxacin decreased from 84.3 to 68.2% and from 84.3 to 70.5%, respectively; to piperacillin-tazobactam from 92.4 to 84.1% and from 92.4 to 84.9%, respectively; while susceptibility to amikacin remained at 97%. For RTI, 2002 and 2010 data are not available for comparison. Comparing to other agents, cefepime (74.3%), ciprofloxacin (71.4%), and piperacillin-tazobactam (79.5%) did not exceed 80% susceptibility; while susceptibility to amikacin was 94.9%.

Conclusions: Despite the emergence and dissemination of extended-spectrum β -lactamases, carbapenemases, and other resistance mechanisms, ertapenem has maintained an overall high level of activity (susceptibility ~90% or higher) among *Enterobacteriaceae* over the past 15 years, while

many other agents have shown substantial decreases in susceptibility. Continuing surveillance of antimicrobial activity is critical, especially as new resistance mechanisms emerge and spread.