Objective: The aim of this work was to characterize the inhibitor-resistant TEM (IRT) beta-lactamases produced by Escherichia coli isolates in Hospital Clinico San Carlos, Madrid (Spain). Methods: A total of 70 cefotaxime and ceftazidime susceptible but amoxicillin-clavulanate resistant E. coli strains were prospectively collected in our hospital from November 2011 to July 2012. Fifty six strains were isolated from urine, 7 from different exudates, 5 from surgical wound, one isolate from catheter and one from blood. Bacterial identification and antibiotic susceptibility patterns were carried out by the semiautomatic Wider system (Francisco Soria Melguizo, Madrid, Spain) or VITEK®2 system (bioMérieux, Marcy-l'Etoile, France). In addition, the MIC of amoxicillin-clavulanate was determined by E-test (AB Biodisk, Solna, Sweden). The Clinical and Laboratory Standards Institute breakpoints were used. IRT-producing isolates were characterized by PCR and sequencing. The nucleotide sequences obtained were compared with those available in the NCBI and Lahey databases.

Results: Among 70 amoxicillin-clavulanate resistant E. coli isolates, 28 (40%) were IRT enzymes producers. The IRTs identified were TEM-30 (16), TEM-40 (7), TEM-31 (1), TEM-34 (1), TEM-39 (1), TEM-54 (1) and TEM-76 (1). All of these producing IRT isolates were susceptible to piperacillin-tazobactam, except one strain.

Conclusions: The frequency of IRT producers among amoxicillin-clavulanate resistant E. coli isolates was 40%, with most of them causing urinary tract infections. TEM-30 and TEM-40 were the most prevalent enzymes detected. Piperacillin-tazobactam is a great choice for the treatment of infections caused by producing IRT E.coli.