

Table 1. Summary of twenty studies describing antimicrobial stewardship strategies in the Middle East (continued)

Study	Country	Design	Setting (No. of patients)	Evaluated component	Comparator	Outcome	Recommendations
Al-Abri et al. 2012	Oman	Retrospective evaluation of computerized patients' case notes	Hospital (172)	Quality of care for community-acquired pneumonia management	Compliance with GCC community-acquired pneumonia guidelines	Poor adherence to guidelines in terms of prevention, diagnosis and severity assessment	Development and implementation of a locally based integrated care pathway
El Hassan et al. 2015	United Arab Emirates	Retrospective evaluation of patient records	Hospital (250)	Surgeons' adherence in terms of prescribing, selection, dosing and duration of antimicrobials	Compliance with local surgical antimicrobial prophylaxis guidelines	Poor adherence to guidelines (32.1%)	Protocol implementation Awareness and continuing medical education to target antimicrobial prophylaxis Clinical pharmacy services Cyclic auditing Deployment of clinical pharmacists in surgical wards
Aly et al. 2012	Kuwait	Retrospective evaluation of patient records	Government hospital (1112)	Physicians' adherence to antimicrobial administration	Compliance with local antibiotic policy guidelines	Poor adherence to guidelines (52.7% of prescriptions matching the policy and 30.4% full adherence to antibiotic administration)	Optimizing adherence by updating policies
Hammuda et al. 2013	Qatar	Point prevalence survey in the form of patient chart audit	Cancer hospital (58)	Appropriateness of use of antimicrobial agents in cancer population	Compliance with local antimicrobial prescribing policies and febrile neutropenia guidelines	Poor adherence to policies and guidelines. High prevalence of antimicrobial misuse: 57.6% of prescriptions were ordered by an approved prescriber with only 33% adherence to febrile neutropenia guidelines	Interdisciplinary collaboration and development of antimicrobial stewardship programmes
Khan et al. 2012	Qatar	Retrospective evaluation of patient medical records	Hospital (596)	Appropriateness of use of a broad-spectrum antibiotic	Compliance with local guidelines and annual surveillance periodically updated by consensus among experts	Injudicious use of antibiotics: unjustified prescriptions; inappropriate empiric prescriptions (57%); inappropriate drug modification based on the results of microbial cultures and antibiograms (22%)	Dissemination of the implemented local guidelines via staff education and widespread publication Rationalization of use in different hospital units via appropriateness in initial empiric and modification of therapy post-culture results Ongoing annual surveillance Restrictive measures such as mandatory infectious disease team consultation