

TABLE 1

Characteristics of included studies

Study	Country	Hospital size (number of hospital beds)	Study period (years)	Type of bacteria or resistant bacteria investigated		Infection control practice and lag times	Antibiotics use (lag time in months)	Autoregressive (AR) / moving average (MA) term (order)	R2
Lopez-Lozano et al, 2000 ¹⁶	Spain	400	7.5	Gram-ve bacilli and P. aeruginosa			Ceftazidime and imipenem	(i) Ceftazidime-gram-negative bacilli: lag 3 and 5 (months); (ii) Imipenem-P. aeruginosa: AR=5, MA=1, MA= 5.	(i) Ceftazidime-gram-negative bacilli: R2=0.44; imipenem-P. aeruginosa: R2= 0.63. ARIMA model with a R2=0.57: transfer function model R2=0.44
Monnet et al, 2004 ¹⁸	Scotland	1200	5	MRSA			Macrolide (lag=1), 3rd generation cephalosporin (lag-each month= 4,5,6,7,8) and fluoroquinolone (lag-each month= 4,5,6)	lag=1	0.902
Mahamat et al, 2005 ²⁷	France	1659	6.5	E. coli (ofloxacin- and ciprofloxacin- resistant)			Ofloxacin resistance: ofloxacin use (lag=4); ciprofloxacin (lag=4); norfloxacin (lag=6). Ciprofloxacin resistance: ciprofloxacin use (lag=4); ofloxacin (lag=4); norfloxacin (lag=5)		Ciprofloxacin resistance=0.40, Ofloxacin resistance = 0.64
Aldeyab et al, 2008 ¹¹	Northern Ireland, UK	426	5	MRSA		Alcohol-based hand rub (lag=3), Alcohol-impregnated wipes (lag=2)	Fluoroquinolone (lag =1), 3rd generation cephalosporin (lag= 2), macrolides (lag=4); amoxicillin/clavulanic acid (lag=1)	lag=4	0.784
Kritsotakis et al, 2008 ³⁰	Greece	700	7	VRE			VRE; Glycopeptide use (lag=1); fluoroquinolone (lag= 2); 3rd and 4th generation cephalosporins (lag=1); Combinations of penicillins with BLI (lag=3)		(i) VRE Moving average R2=0.49 and (ii) LTF model for VRE incidence, accounting for antibiotic use R2=0.56
Hocquet et al, 2008 ²²	France		6	P. aeruginosa			Aminoglycoside, fluoroquinolone, and cefepime	MA=1 AR=3	
Vernaz et al, 2009 ²⁴	Scotland	879	3	C. difficile			Piperacillin/tazobactam (lag= 4-5); ciprofloxacin (lag=0-5) and cefuroxime (lag= 2, 3, 4); fluoroquinolones (lag=4); co-amoxiclav (lag= 0)	MA=2	0.61
Kaier et al., 2009 ²⁰	Germany	1600	5	MRSA and C. difficile		Alcohol-based hand rub (lag=3-7)	MRSA: 3rd generation cephalosporin use (lag= 3-4); 2nd generation cephalosporin (lag=1); fluoroquinolone (lag =4) and linnosamides (lag=2). For C. difficile: 3rd generation cephalosporin (lag=0-1); macrolides (lag=2-3)	(i) AR term=1; (ii) AR=4	(i) R2=0.66; (ii) CDI R2=0.55
Vernaz et al, 2011 ²⁸	Switzerland	2200	7	E. coli		Hand hygiene observation of healthcare personnel	Fluoroquinolone resistance=ciprofloxacin (lag= 0-1), moxifloxacin (lag=4). For cefepime resistant E. coli= ciprofloxacin use (lag=1); ceftriaxone (lag=0); piperacillin / tazobactam (lag=3) and cefepime (lag=3)	(i) CA ciprofloxacin resistance, E. coli resistant to ciprofloxacin MA= 8, AR= 1 (ii) HA ciprofloxacin resistance: AR= 2 (iii): E.coli resistant to cefepime: AR=1	R2 =0.51
Aldeyab et al, 2012 ²⁹	Northern Ireland, UK	411	5	ESBL			Fluoroquinolone (lag=1)	AR=4	0.38
Bertrand et al, 2012 ²¹	France	1200	9	MRSA		Alcohol-based hand rub (lag=2), gloves (lag= 1.), colonisation pressure of imported MRSA (lag=2)	Quinolones (lag=1), macrolides (lag= 2) and aminoglycosides (lag=1)	Lag= 3	0.4
Gilca et al, 2012 ²⁵	Canada		4	C. difficile			Fluoroquinolones (lag=2); macrolides (lag=1)	AR=1	
Zou et al, 2015 ²³	China	2341	4	P. aeruginosa and K. pneumoniae			P. aeruginosa = imipenem; meropenem. K. pneumonia = amikacin		
Vibet et al, 2015 ¹⁷	France	3000	6	ESBL			3rd and 4th generation cephalosporins (lag = -5); fluoroquinolones (lag= -3)		
Tansarli et al 2018 ²⁶	Greece	500	15	K. pneumoniae			Colistin use (lag=1)	Lag=1	ARIMA model =0.52 and for transfer function model=0.69

MRSA: methicillin-resistant *Staphylococcus aureus*; E. coli: *Escherichia coli*; VRE: vancomycin-resistant enterococci; P. aeruginosa: *Pseudomonas aeruginosa*;

C. difficile: *Clostridium difficile*; ESBL: extended spectrum beta-lactamase; K. pneumoniae: *Klebsiella pneumoniae*