

Additional file 6 - Characteristics of *E. coli* infections in studies included in systematic review evaluating whether the measures of health or healthcare system burden increase in humans with antimicrobial-resistant *E. coli* infections

Resistant (R) and Susceptible (S) Group Details							Type and Source of Infection			BoD / Overall	
Citation (Reference # in manuscript)	Type of Resistance	Underlying common disease processes or common characteristics	Definition of cases with R	Number of cases with R	Definition of cases with S	Number of cases with S	Selection of R and S groups	Types of infections in study	Source/ timing of infections	Duration of follow-up	BoD Outcome
Abermethyl, J. K., <i>et al.</i> 2015. (50)	Third/fourth/fifth generation cephalosporins or ESBLs	n/a	3GCR EC BSI - 3CGR defined by resistance to cefotaxime and/or ceftazidime	1838	3GCS EC BSI	16641	No selection all EC BSI during study period, but some were not tested or had missing data	Blood stream infection	Community-associated; Healthcare-associated; Nosocomial	30-days	1) 30-day mortality; 2) All-cause mortality
Abermethyl, J. K., <i>et al.</i> 2015. (50)	Quinolones	n/a	CIP-R EC BSI - Ciprofloxacin resistance	3647	CIP-S EC BSI	16828	No selection all EC BSI during study period, but some were not tested or had missing data	Blood stream infection	Community-associated; Healthcare-associated; Nosocomial	30-days	1) 30-day mortality; 2) All-cause mortality
Al-Otaibi, F. E., <i>et al.</i> 2013. (87)	Third/fourth/fifth generation cephalosporins or ESBLs	n/a	ESBL EC UTI	113	non-ESBL EC UTI	226	No mention of selection	Urinary tract infection	Not reported	nr	1) All-cause mortality
Alvarez-Uria, G., <i>et al.</i> 2012. (37)	Third/fourth/fifth generation cephalosporins or ESBLs	n/a - all community-acquired the definition is consistent with community-associated	3GCR EC CA infection - 3GCR was based on resistance to cefotaxime	154	3GCS EC CA infection	40	No selection all EC CA infections during study period were included	Blood stream infection; Urinary tract infection; normally sterile site infection; wound infection; pneumonia	Community-associated	21 days	1) All-cause mortality
Anunnatsiri, S., <i>et al.</i> 2012. (42)	Third/fourth/fifth generation cephalosporins or ESBLs	n/a	ESBL EC BSI	32	non-ESBL EC BSI	113	No selection, all EC BSI during study period that were not polymicrobial, transferred to another hospital and had to be the first BSI for each patient.	Blood stream infection	Community-associated; Healthcare-associated; nosocomial	in-hospital	1) All-cause mortality, 2) Treatment failure, 3) Post-infection length of hospital stay

Apisarnthana-rak, A., <i>et al.</i> 2008. (43)	Third/fourth/fifth generation cephalosporins or ESBLs	All patients were community-onset (definition consistent with community-associated/acquired)	ESBL EC CO infection	46	non-ESBL EC CO infection	138	No selection of ESBL EC, all that occurred during study period were included. The non-ESBL EC controls were matched 3:1 to ESBLs. Matched based on site of infection, hospital unit and day of admission (+/- 7 days).	Blood stream infection; Urinary tract infection; skin/soft tissue infection; pneumonia	Community-associated	in-hospital	1) All-cause mortality, 2) Length of hospital stay, 3) Healthcare system costs
Artero, A., <i>et al.</i> 2017. (95)	Third/fourth/fifth generation cephalosporins or ESBLs	All community-onset pyelonephritis or urosepsis in elderly	ESBL EC pyelonephritis or urosepsis	85	non-ESBL EC pyelonephritis or urosepsis	225	No selection all community-onset EC pyelonephritis or urosepsis in elderly during study period	pyelonephritis or urosepsis	Community-associated; Healthcare-associated	In-hospital	1) All-cause mortality, 2) Length of hospital stay
Bert, F., <i>et al.</i> 2008. (103)	Quinolones	All patients had cirrhosis	Ciprofloxacin-resistant EC SPB	11	Ciprofloxacin-resistant EC SPB	60	No selection, all EC SBP cases during the study period	Spontaneous bacterial peritonitis	Community-associated; Healthcare-associated; nosocomial	in-hospital	1) All-cause mortality
Bollestad, M., <i>et al.</i> 2018. (107)	Third/fourth/fifth generation cephalosporins or ESBLs	all treated with oral pivmecillinam, women with community-acquired UTI	monoculture of ESBL-EC in urine	88	monoculture of non-ESBL-EC in urine	74	Cases and controls identified at the micro labs, then registered by primary physicians. Initially controls matched to cases on age (+5 yr) but then that was stopped after 27 matched pairs.	Urinary tract infection	Community-associated	up to 2 weeks after end of treatment	1) Treatment failure
Camins, B. C., <i>et al.</i> 2011. (78)	Quinolones	n/a	Fluoroquinolone-resistant EC bacteremia	93	Fluoroquinolone-susceptible EC bacteremia	93	All FQ-R EC BSI during the study period were included. The FQ-S E BSI controls were matched 1:1 to FQ-R. They were randomly matched by year of infection.	Blood stream infection	Community-associated; Healthcare-associated; Nosocomial	in-hospital up to 30 days	1) 30-day mortality, 2) All-cause mortality, 3) Treatment failure, 4) Length of hospital stay
Can, F., <i>et al.</i> 2015. (41)	Third/fourth/fifth generation cephalosporins or ESBLs	n/a	ESBL EC UTI	70	non-ESBL EC UTI	224	No selection, all EC UTI during study period	Urinary tract infection	Not reported	10 days	1) Treatment failure
Can, F., <i>et al.</i> 2015. (41)	Quinolones	n/a	Quinolone-resistant EC UTI	114	Quinolone-susceptible EC UTI	180	No selection, all EC UTI during study period	Urinary tract infection	Not reported	10 days	1) Treatment failure

Can, F., <i>et al.</i> 2015. (41)	Multidrug resistance	n/a	MDR EC UTI - MRD defined as resistance to 3 or more different groups of antibiotics (B lactams, aminoglycosides, quinolones, TMP-SMX)	116	non-MDR EC UTI	178	No selection, all EC UTI during study period	Urinary tract infection	Not reported	10 days	1) Treatment failure
Cereto, F., <i>et al.</i> 2008. (104)	Quinolones	All patients had cirrhosis and were treated empirically with cefotaxime or ceftriaxone	quinolone-resistant EC SBP, defined by resistance to ciprofloxacin	18	quinolone-susceptible EC SBP	29	no selection, all EC SBP cases during study period	Spontaneous bacterial peritonitis	Not reported	3 months	1) All-cause mortality, 2) Treatment failure
Cereto, F., <i>et al.</i> 2008. (104)	Quinolones	All patients had cirrhosis of the liver	quinolone-resistant EC SBP (spontaneous bacterial peritonitis)	12	quinolone-susceptible EC SBP	35	No selection all cases of EC SBP	Spontaneous bacterial peritonitis	Not reported	in-hospital	1) All-cause mortality
Chakraborty, A., <i>et al.</i> 2012. (38)	Third/fourth/fifth generation cephalosporins or ESBLs	n/a	ESBL extra-intestinal EC infection	132	non-ESBL extra-intestinal EC infection	68	No selection all EC infections included as long as they met criteria excluded if received antimicrobials within 1 month, asymptomatic UTI, polymicrobial infections	Blood stream infection; Urinary tract infection; Wound infection, pneumonia, IV device infection, meningitis	Community-associated; Healthcare-associated; Nosocomial	not reported	1) All-cause mortality, 2) Treatment failure
Chauhan, S., 2015. (40)	Third/fourth/fifth generation cephalosporins or ESBLs	n/a	ESBL-producing E. coli invasive infections	85	non-ESBL-producing E. coli invasive infections	85	All cases in time period, and the control closest in time that met eligibility criteria	Invasive infections in hospital patients no further details	Nosocomial only type mentioned.	nr	1) Treatment failure, 2) Length of stay
Cheong, H. J., <i>et al.</i> 2001. (101)	Quinolones	All had to have ≥ 2 positive blood samples	quinolone resistant EC bacteremia	40	quinolone susceptible EC bacteremia	80	All QR EC during study period and controls matched 2:1 to cases. Matched based on date of positive culture result	Blood stream infection	Community-associated; Healthcare-associated; Nosocomial	in-hospital	1) All-cause mortality
Cheong, H. S., <i>et al.</i> 2007. (60)	Third/fourth/fifth generation cephalosporins or ESBLs	All community-onset	ceftriaxone-resistant EC bacteremia	19	ceftriaxone-susceptible EC bacteremia	489	no selection	Blood stream infection	Community-associated; Healthcare-associated	30-day	1) 30-day mortality, 2) All-cause mortality
Cheong, H. S., <i>et al.</i> 2007. (60)	Quinolones	All community-onset	ciprofloxacin-resistant EC bacteremia	132	ciprofloxacin-susceptible EC bacteremia	376	no selection	Blood stream infection	Community-associated; Healthcare-associated	30-day	1) 30-day mortality, 2) All-cause mortality

Cheong, H. S., <i>et al.</i> 2007. (60)	Multidrug resistance	All community-onset	MDR EC bacteremia MDR defined as not susceptible to three or more of the following antimicrobial agents: ampicillin, amikacin or gentamicin or tobramycin, aztreonam, cefotaxime or ceftriaxone or ceftazidime or cefepime, ciprofloxacin, imipenem, piperacillin/tazobactam and trimethoprim/sulfamethoxazole	137	non-MDR EC bacteremia	371	no selection	Blood stream infection	Community-associated; Healthcare-associated	30-day	1) 30-day mortality, 2) All-cause mortality
Cornejo-Juarez, P., <i>et al.</i> 2012. (44)	Third/fourth/fifth generation cephalosporins or ESBLs	all patients have a hematologic malignancy	ESBL EC BSI	100	non-ESBL EC BSI	100	All ESBL EC BSI included and matched to 1 non-ESBL EC BSI. Controls matched to be +/- 30 day prior to the date of isolate for the ESBL EC BSI case.	Blood stream infection	Community-associated; Healthcare-associated; Nosocomial	60-days	1) All-cause mortality, 2) Bacterium-attributable mortality
Courpon-Claudinon, A. <i>et al.</i> 2011. (85)	Third/fourth/fifth generation cephalosporins or ESBLs	n/a	3GC-R EC bacteremia	39	3GC-S EC bacteremia	1012	no selection	Blood stream infection	Community-associated; Healthcare-associated; Nosocomial	in-hospital	1) All-cause mortality
de Kraker, M. E., <i>et al.</i> 2011. (49)	Third/fourth/fifth generation cephalosporins or ESBLs	n/a	3GC-R EC BSI (REC)	111	3GC-S EC BSI (SEC)	1110	all REC and SEC that could be matched to controls with no EC BSI Note: paper describes how both cohorts are matched with controls - these controls do not have E.coli BSI.	Blood stream infection	Community-associated; Healthcare-associated; Nosocomial	30-days	1) 30-day mortality, 2) All-cause mortality, 3) Post-infection length of stay
Denis, B., <i>et al.</i> 2015. (74)	Third/fourth/fifth generation cephalosporins or ESBLs	n/a - the hospital has major clinical areas in HIV, hematology and oncology	ESBL EC bacteremia	41	non-ESBL EC bacteremia	41	All ESBL EC bacteremia cases during study period. Controls (non-ESBL EC bacteremia) were matched 1:1 to cases, matched to the closest date of a case.	Blood stream infection	Community-associated; Healthcare-associated; Nosocomial	30-day	1) 30-day mortality, 2) All-cause mortality, 3) Length of stay

Eom, J. S., <i>et al.</i> 2002. (77)	Quinolones	n/a	quinolone-resistant EC UTI (used ciprofloxacin to determine)	60	quinolone-susceptible EC UTI (used ciprofloxacin to determine)	80	Controls were selected for each case according to the nearest date of a positive urine culture	Urinary tract infection	Community-associated; Healthcare-associated; Nosocomial	30-day	1) 30-day mortality, 2) All-cause mortality, 3) Treatment failure
Esteve-Palau, E., <i>et al.</i> 2015. (75)	Third/fourth/fifth generation cephalosporins or ESBLs	n/a	symptomatic UTI caused by ESBL-EC	60	symptomatic UTI caused by non-ESBL-EC	60	All ESBL EC UTI during study period and controls matched 1:1 to cases. Matched on sex, age, and date of admission.	Urinary tract infection	Community-associated; Healthcare-associated	30-days	1) 30-day mortality, 2) All-cause mortality, 3) Treatment failure, 4) Length of stay, 5) Healthcare system costs
Fan, N. C., <i>et al.</i> 2014. (108)	Third/fourth/fifth generation cephalosporins or ESBLs	all community-onset	ESBL EC UTI	104	non-ESBL EC UTI	208	All cases during study period, match 1:2 to controls by age and sex	Urinary tract infection	All community-onset - Community-associated; Healthcare-associated	not reported	1) Treatment failure, 2) Length of stay
Feng, X. R., <i>et al.</i> 2014. (47)	Third/fourth/fifth generation cephalosporins or ESBLs	All patients on stable continuous ambulatory peritoneal dialysis (CAPD)	ESBL EC peritonitis	32	non-ESBL EC peritonitis	58	No selection all EC peritonitis in CAPD patients during the study period	Peritonitis	Not reported	After enrollment patients, were followed up until the cessation of PD (transfer to hemodialysis, transplantation or death) or the end of the study	1) Bacterium-attributable mortality, 2) Treatment failure
Freeman, J. T., <i>et al.</i> 2012. (70)	Third/fourth/fifth generation cephalosporins or ESBLs	n/a	ESBL EC bacteremia	16	non-ESBL EC bacteremia	16	All cases during the study period, controls were matched 1:1 to cases. Matching criteria: species of organism, type of blood culture, timing of bacteremia, and temporally closest to the case	Blood stream infection	Not reported	30-days	1) 30-day mortality, 2) All-cause mortality
Gagliotti, C., <i>et al.</i> 2008. (111)	Quinolones	All female, community-acquired and at low risk of treatment failure / relapse	ciprofloxacin resistant EC UTI - community acquired	900	ciprofloxacin susceptible EC UTI - community acquired	6820	No selection all community acquired EC UTI	Urinary tract infection	Community-associated; Healthcare associated (all community-acquired)	30-days	1) Treatment failure
Garau, J., <i>et al.</i> 1999. (100)	Quinolones	n/a	quinolone resistant EC bacteremia (ciprofloxacin)	70	quinolone susceptible EC bacteremia (ciprofloxacin)	502	No selection, all EC bacteremia during the study period	Blood stream infection	Community-associated; Healthcare associated; Nosocomial	in hospital	1) All-cause mortality

Gudiol, C., <i>et al.</i> 2010. (67)	Third/fourth/fifth generation cephalosporins or ESBLs	All cancer patients	ESBL EC bacteremia	17	non-ESBL EC bacteremia	118	No selection all EC bacteremia during study period	Blood stream infection	Called it healthcare acquisition with no definition	30-days	1) 30-day mortality, 2) All-cause mortality
Ha, Y. E., <i>et al.</i> 2013. (72)	Third/fourth/fifth generation cephalosporins or ESBLs	All have cancer	ESBL EC bacteremia	95	non-ESBL EC bacteremia	255	No selection all EC bacteremia during study period	Blood stream infection	Community-associated; Healthcare associated; Nosocomial	30-day	1) 30-day mortality, 2) All-cause mortality
Haruki, Y., <i>et al.</i> 2018. (76)	Third/fourth/fifth generation cephalosporins or ESBLs	critically ill patients from ICU	ESBL EC bacteremia	24	non-ESBL EC bacteremia	77	No selection, all EC bacteremia during study period	Blood stream infection	Community-associated; healthcare-associated; Nosocomial	28-day	1) 30-day mortality, 2) All-cause mortality
Henshke-Bar-Meir, R., <i>et al.</i> 2006. (80)	Third/fourth/fifth generation cephalosporins or ESBLs	n/a	ESBL enterobacteriaceae bacteremia	39	non-ESBL enterobacteriaceae bacteremia	119	No selection reported, no matching but aimed for ratio of 3 controls for each case, so there was selection	Blood stream infection	Not reported	in-hospital	1) All-cause mortality
Ho, P. L., <i>et al.</i> 2002. (64)	Third/fourth/fifth generation cephalosporins or ESBLs	n/a	ESBL EC BSI	50	non-ESBL EC BSI	100	74 episodes of ESBL EC BSI during study - 24 excluded (4 - polymicrobial and 20 incomplete medical records). Non-ESBL matched 2:1. Matched on specialty, age (+/- 10 yr), sex and closest date of isolation to ESBL.	Blood stream infection	Community-associated; Healthcare associated; Nosocomial	30 days	1) 30-day mortality, 2) All-cause mortality
Hsieh, C. J., <i>S et al.</i> 2010. (68)	Third/fourth/fifth generation cephalosporins or ESBLs	n/a	ESBL EC community-onset bacteremia	19	non-ESBL EC community-onset bacteremia	385	No sampling, all EC community-onset bacteremia without missing data in the medical record during the study period	Blood stream infection	Community-associated; Healthcare-associated	30-day	1) 30-day mortality, 2) All-cause mortality, 3) Post-infection length of hospital stay
Huang, Y. Y., <i>et al.</i> 2018. (97)	Third/fourth/fifth generation cephalosporins or ESBLs	All patients had urosepsis (bacteremia confirmed from a urinary source and had two criteria for systemic inflammatory response syndrome)	ESBL EC Urosepsis	58	non-ESBL EC Urosepsis	118	All ESBL EC urosepsis cases during study period and random selection of 118 non-ESBL EC urosepsis controls during study period	Blood stream infection (All urosepsis)	Community-associated; Healthcare-associated; Nosocomial	in-hospital	1) All-cause mortality, 2) Length of hospital stay

Huotari, K., <i>et al.</i> 2003. (54)	Quinolones	All nosocomial	nosocomial quinolone resistant EC infection	51	nosocomial quinolone susceptible EC infection	102	All nosocomial QREC cases from that hospital during the study period which had two appropriate controls. Two controls for each case, matched based on having the same type of infection.	Urinary tract infection, UTI with bacteremia, surgical site infection, skin and soft tissue, pneumonia	Nosocomial	30-day	1) 30-day mortality, 2) All-cause mortality, 3) Length of hospital stay
Jeon, J. H., <i>et al.</i> 2012. (110)	Quinolones	All from communities with a high prevalence of fluoroquinolone resistance and were treated with empirical ciprofloxacin	Ciprofloxacin-resistant EC acute uncomplicated pyelonephritis	39	Ciprofloxacin-susceptible EC acute uncomplicated pyelonephritis	216	No selection, all EC acute uncomplicated pyelonephritis that consented and met criteria	Acute uncomplicated pyelonephritis	Not reported	14 to 21-days after completion of treatment but not for all patients	1) Treatment failure, 2) Length of stay
Kang, C. I., <i>et al.</i> 2010. (51)	Third/fourth/fifth generation cephalosporins or ESBLs	all community-onset bacteremia	ESBL EC community-onset bacteremia	82	non-ESBL EC community-onset bacteremia	783	no selection	Blood stream infection	Community-associated; Healthcare-associated	30-days	1) 30-day mortality, 2) All-cause mortality, 3) Treatment failure
Kang, C. I., <i>et al.</i> 2011. (52)	Third/fourth/fifth generation cephalosporins or ESBLs	all bacteremic intra-abdominal infections	broad-spectrum cephalosporin-resistant EC bacteremic intra-abdominal infections. Broad-spectrum cephalosporin-resistance was defined as in vitro resistance to cefotaxime ceftriaxone or ceftazidime	29	broad-spectrum cephalosporin-susceptible EC bacteremic intra-abdominal infections	175	no selection	Blood stream infection	Community-associated; Healthcare-associated; Nosocomial	30-days	1) 30-day mortality, 2) All-cause mortality
Kang, C. I., <i>et al.</i> 2012. (71)	Third/fourth/fifth generation cephalosporins or ESBLs	all community-onset and from culture drawn in ER or outpatient clinics	ESBL EC	108	non-ESBL EC	108	1:1, controls were randomly selected from a group of outpatients, the sample had to be cultured at the same lab during the week following and they were matched according to the culture specimen and acquisition unit	All types of EC infections	Community-associated; Healthcare-associated	30-days	1) 30-day mortality, 2) All-cause mortality
Kaya, O., <i>et al.</i> 2013. (46)	Third/fourth/fifth generation cephalosporins or ESBLs	n/a	ESBL EC BSI	44	non-ESBL EC BSI	69	No selection, all EC BSI during study period	Blood stream infection	Community-associated; Healthcare-associated; Nosocomial	in-hospital	1) All-cause mortality

Khan, F. Y., <i>et al.</i> 2010. (82)	Third/fourth/fifth generation cephalosporins or ESBLs	n/a	ESBL EC bacteremia	27	non-ESBL EC bacteremia	70	No selection, all EC bacteremia during the study period	Blood stream infection	Community-associated; Healthcare-associated; Nosocomial	in-hospital	1) All-cause mortality
Kim, J., <i>et al.</i> 2014. (79)	Quinolones	All patients had cirrhosis	Fluoroquinolone-resistant EC spontaneous bacterial peritonitis	26	Fluoroquinolone-susceptible EC spontaneous bacterial peritonitis	56	No selection, all EC SBP during study period	Spontaneous bacterial peritonitis	Community-associated; Healthcare-associated	30-day	1) 30-day mortality, 2) All-cause mortality
Kim, S. H., <i>et al.</i> 2013. (73)	Third/fourth/fifth generation cephalosporins or ESBLs	All patients had neutropenic fever and had received either chemotherapy or stem cell transplant	ESBL EC bacteremia	15	non-ESBL EC bacteremia	72	No selection, all EC bacteremia in patients with neutropenic fever during the study period	Blood stream infection	Not reported	30-day	1) 30-day mortality, 2) All-cause mortality
Komatsu, Y., <i>et al.</i> 2018. (98)	Third/fourth/fifth generation cephalosporins or ESBLs	n/a	ESBL EC bacteremia	30	non-ESBL EC bacteremia	85	no selection	Blood stream infection	Community-associated; Healthcare-associated; Nosocomial	14-days	1) All-cause mortality
Lambert, M. L., <i>et al.</i> 2011. (53)	Third/fourth/fifth generation cephalosporins or ESBLs	All nosocomial (from ICU) and all cases from ICU	3GC-R E. coli BSI	42	3GC-S E. coli BSI	218	no selection	Blood stream infection	Nosocomial	during ICU stay	1) All-cause mortality, 2) Post-infection length of stay
Laupland, K. B., <i>et al.</i> 2008. (105)	Quinolones	n/a	Ciprofloxacin-resistant EC BSI	257	Ciprofloxacin-susceptible EC BSI	1947	No selection	Blood stream infection	Community-associated; Healthcare-associated; Nosocomial	in-hospital	1) All-cause mortality
Lee, H., <i>et al.</i> 2018. (99)	Third/fourth/fifth generation cephalosporins or ESBLs	All emergency department admissions	ESBL EC UTI	50	non-ESBL EC UTI	100	Randomly enrolled 50 adult patients with ESBL EC UTI. Then 2:1 matching controls to cases, matched by sex and age (+/- 5 years)	Urinary tract infection	Community-associated; Healthcare-associated; Nosocomial	in-hospital	1) All-cause mortality, 2) Length of stay
Lee, S., <i>et al.</i> 2014. (89)	Third/fourth/fifth generation cephalosporins or ESBLs	All treated with empirical ceftriaxone and had a urine culture performed o the first day of hospitalization (all community-onset)	ESBL EC acute pyelonephritis	26	non-ESBL EC acute pyelonephritis	52	Controls matched to cases 2:1 based on matching variables of bacteremia, age, sex, CCI, SAPS II and modified APN score. This was done using a 16 point scale. If there were more than 2 controls with the same score then two were selected randomly.	acute pyelonephritis	Community-associated; Healthcare-associated	2 weeks	1) All-cause mortality, 2) Treatment failure, 3) Length of stay

Leistner, R., <i>et al.</i> 2014. (112)	Third/fourth/fifth generation cephalosporins or ESBLs	n/a	ESBL EC BSI	92	non-ESBL EC BSI	92	Matching of cases to controls 1:1, matched on age +/- 5 yr, sex, CCI +/- 2, discharge year and the LOS before BSI onset in the control had to be at least as long as the case 80% of cases could be matched and 9.4% of controls used	Blood stream infection	Not reported	in-hospital	1) Post-infection length of stay, 2) Healthcare system costs
Leistner, R., <i>et al.</i> 2014. (90)	Third/fourth/fifth generation cephalosporins or ESBLs	n/a	ESBL EC BSI	115	non-ESBL EC BSI	983	no selection	Blood stream infection	Community-associated; Healthcare-associated; Nosocomial	In-hospital	1) All-cause mortality 2) Length of stay
Leistner, R., <i>et al.</i> 2014. (91)	Third/fourth/fifth generation cephalosporins or ESBLs	n/a	ESBL EC BSI	178	non-ESBL EC BSI	1321	No selection all EC BSI during study period	Blood stream infection	Community-associated; Healthcare-associated; Nosocomial	in-hospital	1) All-cause mortality
Lim, C., <i>et al.</i> 2016. (45)	Multidrug resistance	n/a	MDR EC BSI (MDR based on Magiorakos 2012, non-susceptible to at least three or more antimicrobial categories)	1717	non-MDR EC BSI	2562	no selection	Blood stream infection	Community-associated; Healthcare-associated; Nosocomial	30-day	1) 30-day mortality, 2) All-cause mortality
Ma, J., <i>et al.</i> 2017. (48)	Third/fourth/fifth generation cephalosporins or ESBLs	All had hematologic disease, all nosocomial	ESBL E. coli bacteremia	70	non-ESBL E. coli bacteremia	43	No selection, all nosocomial E. coli bacteremias during study period Had to be hematologic patients at least 14 years old	Blood stream infection	Nosocomial	30 days	1) 30-day mortality, 2) All-cause mortality
Martelius, T., <i>et al.</i> 2016. (56)	Third/fourth/fifth generation cephalosporins or ESBLs	n/a	EC BSI isolates that were resistant or intermediate to third-generation cephalosporins	182	EC BSI isolates that were susceptible to third-generation cephalosporins	2035	No selection, all the EC BSI during the study period	Blood stream infection	Nosocomial	28 day	1) 30-day mortality, 2) All-cause mortality
Maslikowska, J. A., <i>et al.</i> 2016. (93)	Third/fourth/fifth generation cephalosporins or ESBLs	n/a	ESBL-EC infection	61	non-ESBL-EC infection	49	Cases consecutively enrolled in reverse chronological order of hospital admission date. Controls matched to cases 1:1, on the basis of sex, age +/- 5 yr, type of infection, and bed allocation	Blood stream infection; Urinary tract infection; intra-abdominal; pneumonia; joint	Not reported	14 days following discontinuation of antibiotics	1) All-cause mortality, 2) Bacterium-attributable mortality, 3) Treatment failure,

Mezger, M., <i>et al.</i> 2007. (65)	Third/fourth/fifth generation cephalosporins or ESBLs	n/a	ESBL EC bacteremia	46	non-ESBL EC bacteremia	308	No selection all EC bacteremia during study period	Blood stream infection	Community-associated; Nosocomial No definitions of CA and Nos, not sure if HCa are included in CA	30-days	1) 30-day mortality, 2) All-cause mortality, 3) Post-infection length of hospital stay
Namikawa, H., <i>et al.</i> 2017. (96)	Third/fourth/fifth generation cephalosporins or ESBLs	n/a	ESBL EC bacteremia	31	non-ESBL EC bacteremia	98	No selection all EC bacteremia during the study period	Blood stream infection	Nosocomial, What the non-nosocomial represents is not reported	not reported	1) All-cause mortality
Nicolas-Chanoine, M. H., <i>et al.</i> 2012. (86)	Third/fourth/fifth generation cephalosporins or ESBLs		CTX-M producing ESBL EC	152	non-ESBL EC	152	The first inpatient with a clinical sample positive for a non-ESBL EC the same day or within 3 days of the case	All types of EC infections	Community-associated; Healthcare-associated; Nosocomial	in-hospital	1) All-cause mortality
Nussbaum, A., <i>et al.</i> 2018. (88)	Third/fourth/fifth generation cephalosporins or ESBLs	n/a	ESBL E. coli BSI	34	non-ESBL E. coli BSI	66	Cases that met eligibility criteria during the study period and controls matched by age and gender	Blood stream infection	Community-associated; Healthcare-associated	in hospital	1) All-cause mortality, 2) Length of hospital stay
Ortega, M., <i>et al.</i> 2009. (58)	Third/fourth/fifth generation cephalosporins or ESBLs	n/a	ESBL EC bacteremia	211	non-ESBL EC bacteremia	4547	No selection, all EC bacteremia during study period	Blood stream infection	Community-associated; Healthcare-associated; Nosocomial	From diagnosis of bacteremia until 30-days afterwards, until death or until discharge	1) 30-day mortality, 2) All-cause mortality
Ortega, M., <i>et al.</i> 2009. (58)	Quinolones	n/a	Fluoroquinolone resistant EC bacteremia	1300	Fluoroquinolone susceptible EC bacteremia	3458	No selection, all EC bacteremias during study period	Blood stream infection	Community-associated; Healthcare-associated; Nosocomial	Diagnosis of bacteremia until 30 days afterward, death or discharge from hospital	1) 30-day mortality, 2) All-cause mortality

Park, S. H., <i>et al.</i> 2011. (69)	Third/fourth/fifth generation cephalosporins or ESBLs	All community-onset (CA and HCa)	ESBL EC bacteremia	50	non-ESBL EC bacteremia	100	All cases during study period and controls were selected by computer generated random number sampling using the culture register numbers in the microbiology laboratory of the hospital. The controls were selected during the same or following month as the corresponding case. Two controls per case.	Blood stream infection	Community-associated; Healthcare-associated	30 days	1) 30-day mortality, 2) All-cause mortality
Park, S. H., <i>et al.</i> 2015. (94)	Third/fourth/fifth generation cephalosporins or ESBLs	All community-associated	ESBL EC acute pyelonephritis	75	non-ESBL EC acute pyelonephritis	225	All cases during the study period, for each case, three controls were randomly selected from each risk set composed of all eligible control patients treated within a month of the time each case was identified	acute pyelonephritis	Community-associated	4 weeks after the completion of antibiotic therapy	1) All-cause mortality, 2) Treatment failure, 3) Length of hospital stay
Parveen, A., <i>et al.</i> 2015. (39)	Multidrug resistance	All cancer patients	MDR EC bacteremia, MDR defined as resistant to three or more classes of antimicrobial agents, including fluoroquinolones, third-generation cephalosporins, antipseudomonal penicillins + beta-lactamase inhibitors and carbapenems	98	non-MDR EC bacteremia	129	No selection, all EC bacteremias during study period	Blood stream infection	Not reported	30-day	1) 30-day mortality, 2) All-cause mortality
Pena, C., <i>et al.</i> 2008. (66)	Third/fourth/fifth generation cephalosporins or ESBLs	n/a	ESBL EC infection	100	non-ESBL EC infection	100	All consecutive cases during the study period, and controls were matched 1:1 according to the same site of infection and closest date of admission	All types of EC infections	Not reported	30-days	1) 30-day mortality, 2) All-cause mortality
Peralta, G., <i>et al.</i> 2007. (57)	Third/fourth/fifth generation cephalosporins or ESBLs	n/a	EC bacteremia resistant to cefotaxime	31	EC bacteremia susceptible to cefotaxime	632	No selection all EC bacteremia during study period	Blood stream infection	Nosocomial only type mentioned, no details on the other 90.6%	in-hospital	1) All-cause mortality

Peralta, G., <i>et al.</i> 2007. (57)	Quinolones	n/a	EC bacteremia resistant to ciprofloxacin	125	EC bacteremia susceptible to ciprofloxacin	538	No selection, all EC bacteremias during study period enrolled	Blood stream infection	Nosocomial only type mentioned, no details on the other 90.6%	in hospital	1) All-cause mortality
Riu, M., <i>et al.</i> 2016. (55)	Multidrug resistance	All nosocomial	MDR EC bacteremia, MDR based on Magiorakos criteria (three or more antimicrobial categories)	39	non-MDR EC bacteremia	145	All nosocomial EC bacteremias during study period	Blood stream infection	Nosocomial	in hospital	1) Healthcare system costs
Rodriguez-Bano, J. <i>et al.</i> 2010. (83)	Third/fourth/fifth generation cephalosporins or ESBLs	All community-onset	ESBL EC bacteremia	95	non-ESBL EC bacteremia	188	All cases during the study period, 2 controls per case were chosen from non-ESBL EC bacteremias diagnosed during the month following the corresponding case and had to be from the same hospital (randomly selected using a computerized method)	Blood stream infection	All community-onset - Community-associated; Healthcare-associated	14 day, patients followed until death or discharge	1) All-cause mortality
Shin, J., <i>et al.</i> 2012. (106)	Quinolones	All uncomplicated acute pyelonephritis all treated initially with ciprofloxacin or levofloxacin	CIP-resistant E coli UAPN	32	CIP-susceptible E coli UAPN	173	All UAPN E coli patients during time period	Uncomplicated acute pyelonephritis	Community-associated; Healthcare-associated	In hospital, follow-up visits if available	1) All-cause mortality, 2) Treatment failure, 3) Length of hospital stay
Soraas, A., <i>et al.</i> 2014. (109)	Third/fourth/fifth generation cephalosporins or ESBLs	n/a	ESBL-producing E. coli UTI	81	non-ESBL-producing E. coli UTI	262	All cases in the time period, 2-5 controls were randomly selected using excel randomization everytime a case was identified. Both cases and controls had to meet eligibility criteria and provide consent.	Urinary tract infection	Community-associated	2 weeks after initial prescription	1) Treatment failure
Thaden, J. T., <i>et al.</i> 2017. (63)	Multidrug resistance	n/a	monomicrobial gram-negative BSI, MDR - Magiorakos, resistance to at least one antimicrobial in at least three categories	165	monomicrobial gram-negative BSI, non-MDR - resistance to at least one antimicrobial in less than three categories or pansusceptibility	165	No selection, all cases and controls since 01/2009 that provided consent	Blood stream infection	not reported	in-hospital	1) Healthcare system costs

Trecarichi, E. M., <i>et al.</i> 2009. (59)	Third/fourth/fifth generation cephalosporins or ESBLs	All cases and controls have hematological malignancy	ESBL E. coli BSI	26	non-ESBL E. coli BSI	36	No selection, all cases and controls in the time period	Blood stream infection	Community-associated; Healthcare-associated; Nosocomial	30 days	1) 30-day mortality, 2) All-cause mortality
Trecarichi, E. M., <i>et al.</i> 2009. (59)	Quinolones	Hematological malignancy in all cases and controls	Fluoroquinolone R E coli BSI	39	Fluoroquinolone S E coli BSI	23	No selection all cases and controls in study time period included	Blood stream infection	Community-associated; Healthcare-associated; Nosocomial	30 days	1) 30-day mortality, 2) All-cause mortality
Tumbarello, M., <i>et al.</i> 2010. (84)	Third/fourth/fifth generation cephalosporins or ESBLs	n/a	ESBL-producing E. coli BSI	37	non-ESBL-producing E. coli BSI	97	No selection, all cases and controls included from time period	Blood stream infection	Community-associated; Healthcare-associated; Nosocomial	In hospital, 21-day	1) All-cause mortality, 2) Treatment failure, 3) Post-infection length of hospital stay, 4) Healthcare system costs
Uzodi, A. S., <i>et al.</i> 2017. (62)	Multidrug resistance	n/a	MDR EC infection is resistant to any antibiotic in 3 or more of the following drug classes : 1) ampicillin/sulbactam, 2) piperacillin/tazobactam, 3) TMS, 4) fluoroquinolones, 5) aminoglycosides, 6) 1st or 2nd generation cephalosporins, 7) extended-spectrum cephalosporins, 8) carbapenems	34	non-MDR EC infection	284	No selection all cases and controls during the study period	Not reported, 90% from urine but that includes colonization	Not reported for infections only, including colonization Community-associated; Healthcare associated; Nosocomial	not reported	1) All-cause mortality, 2) Treatment failure, 3) Length of hospital stay
Van Aken, S., <i>et al.</i> 2014. (92)	Third/fourth/fifth generation cephalosporins or ESBLs	n/a	ESBL-producing E. coli BSI	70	non-ESBL-producing E. coli BSI	140	The cases were enrolled if they met inclusion criteria and provided consent during the study period. The controls were matched for time period, bacterial species, occurrence of bacteremia, and study location. Controls selected by computer randomization of all possible controls. Cases to controls 1:2.	Blood stream infection	Community-associated; Healthcare-associated; Nosocomial	14 days	1) All-cause mortality, 2) Length of hospital stay
Yip, T., <i>et al.</i> 2006. (81)	Third/fourth/fifth generation cephalosporins or ESBLs	All end-stage renal disease treated by continuous ambulatory peritoneal dialysis	ESBL-producing E. coli	11	non-ESBL-producing E. coli	77	All E. coli peritonitis cases in the study time period, then cases ESBL and controls non-ESBL	Peritonitis	Not reported	not reported	1) All-cause mortality, 2) Treatment failure

Yoon, E. J., <i>et al.</i> 2018. (61)	Third/fourth/fifth generation cephalosporins or ESBLs	n/a	resistant to 3rd and 4th generation cephalosporins in E. coli BSI	524	susceptible to 3rd and 4th generation cephalosporins in E. coli BSI	968	No selection, all E. coli BSI during study periods	Blood stream infection	Not reported	Until hospital discharge or at least for 30 days	1) 30-day mortality, 2) All-cause mortality
Yoon, E. J., <i>et al.</i> 2018. (61)	Quinolones	n/a	E. coli BSI resistant to fluoroquinolones	590	E. coli BSI susceptible to fluoroquinolones	902	No selection, all E. coli BSI during the study period	Blood stream infection	Not reported	Until hospital discharge or at least for 30 days	1) 30-day mortality, 2) All-cause mortality
Yoon, E. J., <i>et al.</i> 2018. (61)	Multidrug resistance	n/a	MDR, nonsusceptible to at least 3 drug classes , ref Magiorakos	865	non-MDR, nonsusceptible to less than 3 drug classes	627	No selection, all E. coli BSI during study period	Blood stream infection	Not reported	Until hospital discharge or at least 30 days	1) 30-day mortality, 2) All-cause mortality