

Supplementary Materials

Title: Hospital-wide genomic surveillance reveals heterogeneous transmission dynamics of sink-associated carbapenemase-producing Enterobacterales

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Supplementary Methods

Methods of environmental sampling and cultures

For sinks, sink basins and drains were sampled using flocked ESwabs (COPAN Diagnostics, Murrieta, CA). The entire basin surface was swabbed, and the drain was sampled by inserting the swab into the pipe below the grate and rotating it against the inner pipe surface. For toilets and hoppers, the inner surface under the rim and the handle surface were swabbed. Dry items and commonly used equipment were sampled using pre-moistened ESwabs. For each surface, 2–4 swabs were used. ESwabs were inoculated directly into tryptone soy broth (TSB) (Asan Pharmaceutical), transported to the microbiology laboratory and incubated at 37°C for 24–48 h. If turbidity was observed, 10 µL of broth was subcultured onto ChromID CARBA (bioMerieux) and incubated at 37°C for 24 h. Suspected CRE colonies were selected and subcultured on MacConkey plates (Asan Pharmaceutical) at 37°C for 24 h. Isolates were identified using matrix-assisted laser desorption ionisation-time-of-flight mass spectrometry (Bruker Daltonics, Billerica, MA, USA) according to the manufacturer's instructions. Antimicrobial susceptibility testing was performed using the MicroScan WalkAway 96 Plus system (Beckman Coulter). Minimum inhibitory concentrations for meropenem, imipenem and colistin were additionally determined by broth microdilution according to 2021 Clinical and Laboratory Standards Institute guidelines. Carbapenemase genes were detected using Xpert Carba-R (Cepheid) and subtyped by PCR; species identification was confirmed by 16S rRNA gene sequencing.

Rectal swabs were inoculated directly onto ChromID CARBA agar with concurrent Xpert Carba-R testing [1]. Subsequent isolation, identification and susceptibility testing followed the procedures used for environmental isolates.

Environmental IPC interventions

In response to environmental contamination, sink management programme was implemented across the hospital. Initial sink decontamination involved thermal and chemical disinfection of sink drains and strainer replacement. Thermal disinfection was applied using pressurized steam (120°C for 3 minutes) followed by a 1-minute hot water flush. Following thermal disinfection, surface cleaning was performed with sodium dichloroisocyanurate (NaDCC) solution-soaked wipes (5,000 ppm, ≥ 10 -minute contact time). Drain disinfection involved retaining 10 L of NaDCC solution (5,000 ppm) for 30 minutes. For maintenance, daily disinfection consisted of sink surface cleaning with NaDCC solution (1,000 ppm) and retention of the same solution in drains for 10 minutes. NaDCC solutions were prepared immediately before use in quantities sufficient for each sink disinfection procedure and were discarded immediately after use; diluted solutions were neither stored nor reused.

In addition to daily sink disinfection, standardized environmental cleaning and disinfection protocols were implemented throughout the hospital using a risk-based approach. In brief, high-touch surfaces and floors were cleaned at least daily in general wards and twice daily in intensive care units (ICUs) and isolation rooms, with additional cleaning when visibly soiled. Terminal cleaning was performed after patient discharge or transfer, and included cleaning and disinfection of all environmental surfaces, patient-care equipment, handwashing sinks, and floors. High-touch surfaces were disinfected using either quaternary ammonium compound wipes or NaDCC (500 ppm)-soaked wipes according to material compatibility, with a minimum contact time of 5 minutes. Patient rooms and reusable equipment used for patients colonized or infected with multidrug-resistant organisms, including carbapenemase-producing Enterobacterales (CPE), were disinfected using NaDCC (500 ppm). Following identification of a new CPE case, enhanced environmental disinfection using NaDCC (1,000 ppm) was implemented to mitigate potential unrecognized environmental transmission. Floors and toilets were routinely disinfected using sodium hypochlorite (500 ppm). Cleaning quality was

monitored through direct observation, visual inspection, and regular adenosine triphosphate (ATP) bioluminescence testing. ATP testing was performed every two weeks in ICUs and after terminal cleaning, with a target cleanliness threshold of ≤ 250 relative light unit (RLU). Surfaces and reusable equipment exceeding this threshold underwent repeat cleaning and reassessment.

Appropriate sink use was promoted through targeted education and awareness campaigns for healthcare workers. Handwashing sinks were labelled and restricted to hand hygiene use; disposal of IV fluids, blood or other body fluids into these sinks was prohibited. Medical supplies, equipment and personal items were placed at least 1 metre from nurse-station sinks, and splash guards were installed where required.

For hand hygiene, handwashing sinks were equipped with non-refillable liquid soap dispensers containing a benzalkonium chloride-based antiseptic handwash (NewGen Science). Alcohol-based hand hygiene was provided using a hand sanitizer containing 70% (v/v) ethyl alcohol (GOJO Industries), and was readily available at the point of care.

After CPE detection during second-round environmental sampling, all waste pipes in nurse-station and dirty utility-room sinks were replaced in September 2021. Daily disinfection and environmental cleaning protocols were maintained throughout.

Whole-genome sequencing and bioinformatics analysis

Whole-genome sequencing

The genomic investigation included 61 available isolates: 27 environmental (64.3%, 27/42) and 34 clinical (59.6%, 34/57). The 27 environmental isolates comprised 14 previously reported New Delhi metallo- β -lactamase-1 (NDM-1) producing Enterobacterales (NDM-1_CPE) isolates [2] reanalysed for this study and 13 newly sequenced isolates. Clinical isolates

included 32 isolates collected during the study period and two historical *Klebsiella pneumoniae* carbapenemase (KPC)-4–producing *Citrobacter freundii* (KPC-4-CF) isolates from 2019 and 2020, which were included to assess temporal and genomic links with environmental isolates. All clinical isolates underwent WGS for this study.

Genomic DNA was extracted using the QIAamp DNA Mini Kit (Qiagen, Hilden, Germany) according to the manufacturer's instructions. DNA integrity was assessed by agarose gel electrophoresis, and DNA concentration was measured using a Qubit 2.0 fluorometer (Invitrogen, Carlsbad, CA, USA). For Illumina short-read sequencing, genomic DNA was fragmented to approximately 550 bp using the M220 Focused Ultrasonicator™ (Covaris Ltd, Brighton, UK). Fragment size distribution and concentration were assessed using the 4200 TapeStation System (Agilent, Santa Clara, CA, USA). Libraries were prepared using the NEBNext Ultra II FS DNA Library Prep Kit (New England Biolabs, Ipswich, MA, USA) and sequenced on the Illumina NovaSeq 6000 platform with 2×150 bp paired-end reads using the NovaSeq 6000 S2 Reagent Kit v1.5 XP (300-cycle).

Long-read sequencing was performed for selected isolates, including DSMCPE166 and DSMCPE178. Libraries were prepared using the SMRTbell Prep Kit 3.0 (PacBio, Cat. No. 102-182-700) and sequenced on the PacBio Sequel II platform (Pacific Biosciences, Menlo Park, CA, USA). Four previously sequenced NDM-1-CPE isolates, DSMCPE128, DSMCPE145, DSMCPE168 and DSMCPE233, were included in plasmid analyses.

Bioinformatics analysis

Illumina short reads were assembled *de novo* with SPAdes (v3.15.3) or Unicycler (v0.5.1), and long reads were assembled with Unicycler (v0.5.1). Species identification was verified using Kraken2 (v2.17.1)[3]. Antimicrobial resistance genes (ARGs) were identified using AMRFinderPlus (v3.12.8)[4], with thresholds of $\geq 99\%$ coverage and $\geq 97\%$ nucleotide identity.

Genetic relatedness among isolates was assessed using multilocus sequence typing (MLST) and core-genome single-nucleotide polymorphism (cgSNP) analysis. Sequence types (STs) were identified using the MLST tool (v2.22). Complete genome sequences served as references for variant calling with Snippy (v4.6)[5]: DSMCPE145 for NDM-1-producing *Enterobacter asburiae*, DSMCPE166 for KPC-4-producing *Citrobacter freundii*, and the previously reported DSMCPE22 for KPC-2-producing *K. pneumoniae* [6]. Core SNP alignments were generated using Snippy-core, and maximum-likelihood phylogenetic inference was performed using IQ-TREE (v2.4). Pairwise SNP distance matrices were generated using snp-dists to quantify relatedness. Isolates with ≤ 7 pairwise SNP differences were defined as the same clone; those with ≤ 30 SNP differences were considered genetically related [7].

Plasmid replicon types and mobile genetic elements associated with carbapenemase genes were identified using PlasmidFinder (v2.1.6) [8] and VRprofile2 (v1.0.6)[9]. For isolates with complete genome sequences, plasmids harbouring carbapenemase genes were annotated using Prokka (v1.14.6)[10]. For isolates sequenced using short reads, the presence of specific plasmids was inferred by aligning reads to the plasmid backbone using Bowtie2 (v2.5.4), followed by per-base read-depth calculation using Samtools depth (v1.22), including all reference positions. Minimum read depth was summarised in 90 bp bins and visualised as a heatmap in Microsoft Excel (Microsoft Corporation, Redmond, WA, USA) to evaluate plasmid coverage breadth and depth across isolates. Genomic contexts surrounding *bla*_{NDM-1} and *bla*_{KPC-2} were visualised using the gggenes R package.

All bioinformatics analyses were conducted on the Galaxy Europe platform [11] unless otherwise specified.

	BUILDING 1		BUILDING 2
	EAST WING	WEST WING	NORTH WING
8F	B1_8F_E Surgical-Medical (Surgery, rehabilitation)	B1_8F_W Surgical (Surgery)	OFFICE
7F	B1_7F_E Surgical (Orthopedic surgery)	B1_7F_W Surgical (Orthopedic surgery)	OFFICE
6F	B1_6F_E Pediatric & other departments	B1_6F_W Surgical (Orthopedic surgery)	B2_6F_N Medical (Nephrology)
5F	B1_5F_E Medical-Surgical (Cardiology, Chest surgery)	5F_ICU1 Medical ICU including CCU	B2_5F_N Medical (Oncology)
	5F_ICU2 Surgical ICU		
4F	B1_4F_E Medical (Pulomology, etc)	B1_4F_W Surgical (ENT, Urology, etc)	Hospice Hospice care
3F	B1_3F_E Surgical (Neurosurgery)	B1_3F_W Surgical (Obstetrics & Gynecology)	B2_3F_N Medical (Gastroenterology- hepatobiliary)
		NICU	

Figure S1. Schematic floor plan of the study hospital

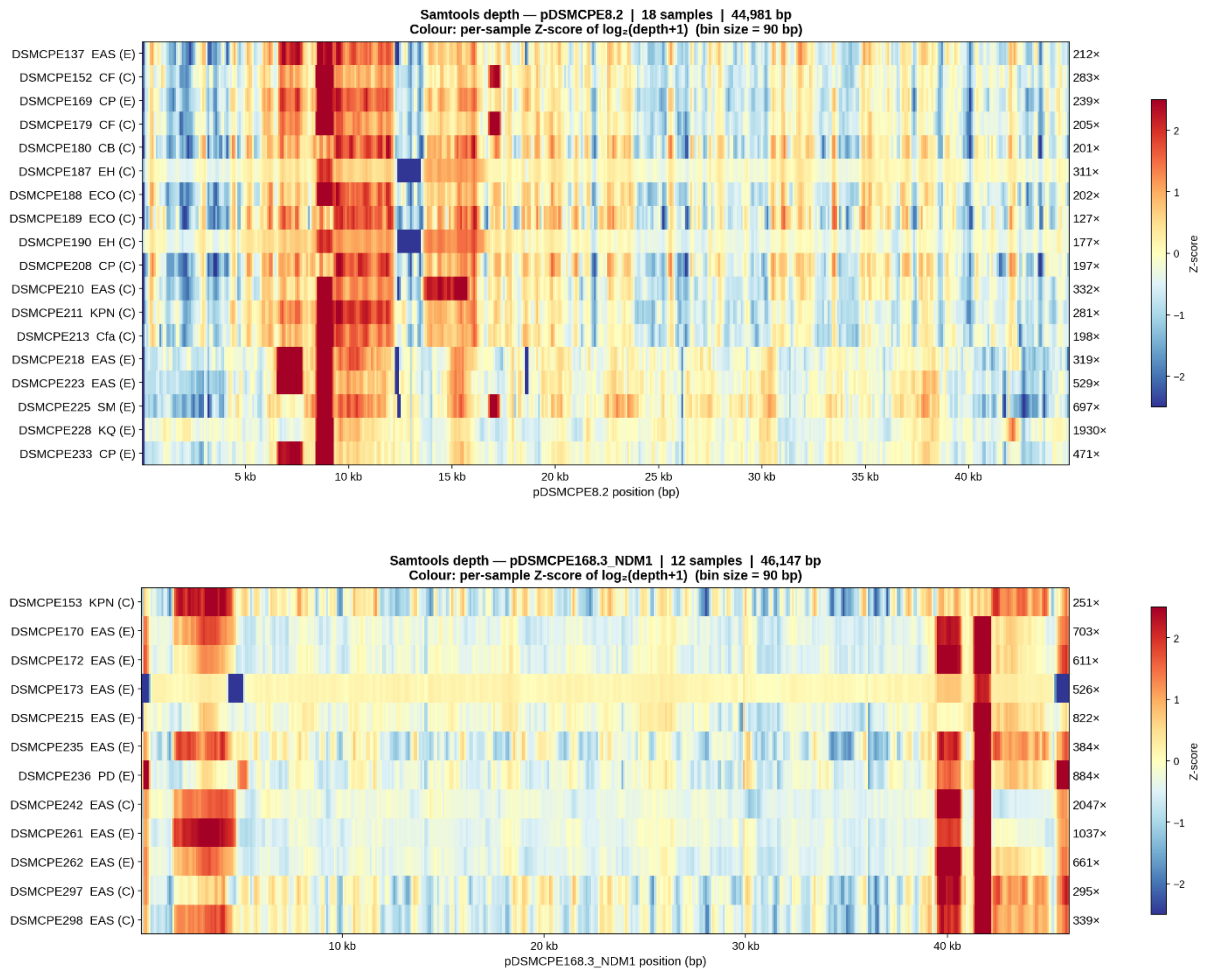


Figure S2. Coverage heatmap of IncX3 plasmid carrying *bla*_{NDM-1}: pDSMCPE8.2 (upper) and pDSMCPE168.3 (lower) across NDM-1 producing Enterobacteriales

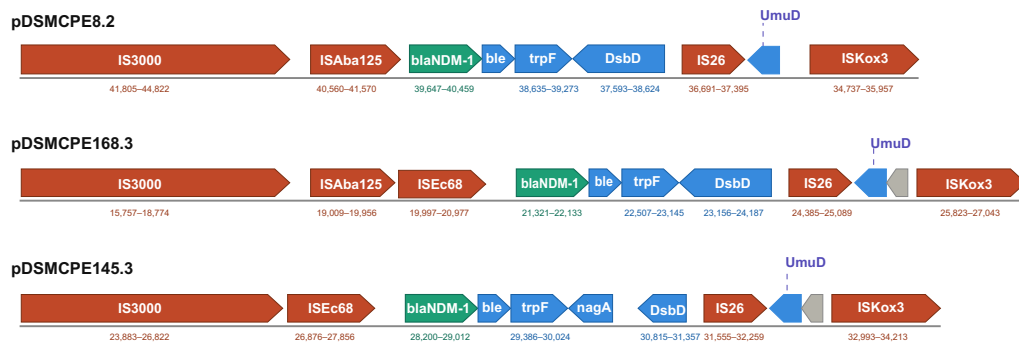
Colour represents per-sample Z-score of $\log_2(\text{depth}+1)$; mean depth per sample shown on right (×). Abbreviations: CF, *Citrobacter freundii*; CP, *Citrobacter portucalensis*, CB, *Citrobacter braakii*; Cfa, *Citrobacter farmer*; EAS, *Enterobacter asburiae*; ECO, *Escherichia coli*; EH, *Enterobacter hormaechei*; KPN, *Klebsiella pneumoniae*; KQ, *Klebsiella quasipneumoniae*; PD, *Phytobacter diazotrophicus*; SM, *Serratia marcescens*; (C), clinical isolate; (E), environmental isolate.



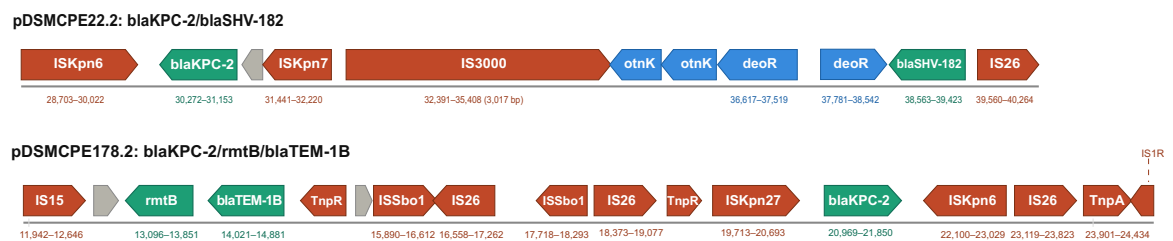
Figure S3. Putative map of horizontal gene transfer through IncX3 plasmids carrying *bla*_{NDM-1} between the environment and patients (dashed line) and clonal transmission of ST484 *Enterobacter asburiae* from environmental sinks to multiple patients (solid line).

Abbreviations: Clin, clinical isolate; Env, environmental isolate; ST, sequence type

(A) *bla*_{NDM-1} mobilome · left-aligned at IS3000



(B) *bla*_{KPC-2} mobilome



(C) *bla*_{KPC-4} mobilome

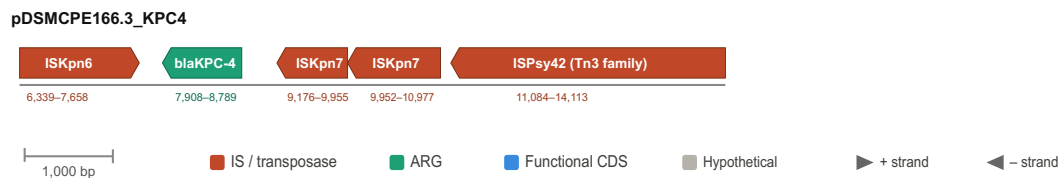


Figure S4. Mobilomes carrying carbapenemases in carbapenemase-producing Enterobacterales isolates undergoing long-read sequencing. (A) *bla*_{NDM-1} mobilomes on IncX3 plasmids (pDSMCPE8.2, pDSMCPE168.3, pDSMCPE145.3); (B) *bla*_{KPC-2} mobilomes and associated antimicrobial resistance genes on pDSMCPE22.2 (IncX3) and pDSMCPE178.2 (IncFII(pHN7A8), IncR); (C) *bla*_{KPC-4} mobilome on pDSMCPE166.3 (Col440I).

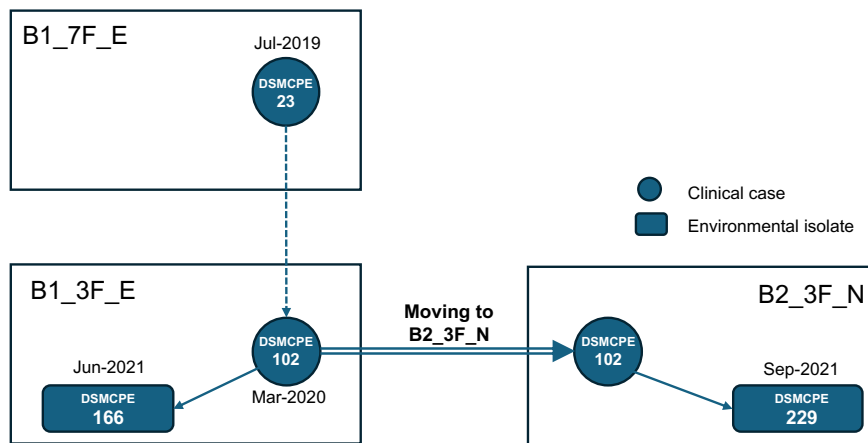


Figure S5. Inter-ward transfer of a patient carrying KPC-4 producing *Citrobacter freundii* ST265 and subsequent environmental contamination in each ward.

Table S1. Characteristics of hospital-linked CPE cases with corresponding sample ID

Case No	Age/ Sex	Infection Month	Gene	Species	Specimen	Dep	Diagnosis	Acquisition location	Sample ID
P01	69/F	Jan-21	KPC-2	<i>K. pneumoniae</i>	Stool	CV	Unstable angina	B1_5F_E	DSMCPE115
P02	65/F	Jan-21	KPC-2	<i>K. pneumoniae</i>	Stool	HO	Pancreatic cancer	B2_5F_N	DSMCPE116
P03	75/M	Jan-21	NDM-1	<i>E. coli</i>	Stool	URO	Bladder cancer	B1_5F_ICU2	
P04	71/F	Feb-21	NDM	<i>E. coli</i>	Stool	GS	GB cancer	B1_8F_W	
P05	39/M	Feb-21	NDM	<i>K. oxytoca</i>	Stool	GI-HB	Liver cirrhosis	B2_3F_N	
P06	79/F	Mar-21	KPC-2	<i>K. pneumoniae</i>	Stool	GI-HB	Spondylodiscitis	B2_3F_N	DSMCPE142
P07	68/M	Apr-21	NDM-5	<i>K. pneumoniae, E. coli</i>	Stool	GI-HB	Liver abscess	B2_3F_N	
P08	75/M	Apr-21	KPC-2	<i>K. pneumoniae</i>	Stool	GI-HB	Pancreatic cancer	B2_3F_N	DSMCPE155
P09	98/F	May-21	KPC-2	<i>K. pneumoniae</i>	Stool	GI-HB	Cholangiocarcinoma	B1_4F_E	DSMCPE183
P10	78/F	May-21	NDM-1	<i>C. freundii</i>	Stool	HO	Lymphoma	B1_3F_W	DSMCPE152
P11	71/M	May-21	NDM-1	<i>K. pneumoniae, E. coli</i>	Stool	NEP	ESRD	B2_6F_N	DSMCPE153
P12	85/F	May-21	NDM-1	<i>C. freundii</i>	Stool	GY	Cervical cancer	B1_3F_W	
P13	66/F	May-21	KPC-2	<i>K. pneumoniae</i>	Stool	NS	Status epilepticus	B1_7F_W	
P14	69/F	May-21	NDM-1	<i>K. pneumoniae</i>	Stool	GY	Ovary cancer	B1_3F_W	
P15	67/F	May-21	NDM-5	<i>E. coli</i>	Stool	HO	Colon cancer	B2_5F_N	
P16	64/M	Jun-21	NDM-1	<i>C. braakii</i>	Stool	RM	Cervical spondylosis	B1_8F_E	DSMCPE180
P17	75/F	Jun-21	NDM	<i>C. freundii</i>	Stool	RM	Cerebellar infarction	B1_8F_E	
P18	79/M	Jun-21	NDM-1	<i>C. freundii</i>	Stool	GI-HB	Decompensated LC	B1_5F_ICU1	DSMCPE179
P19	68/M	Jul-21	NDM-1	<i>E. hormaechei</i>	Stool	HO	Stomach cancer	B2_5F_N	DSMCPE187
P20	56/F	Jul-21	NDM-1	<i>E. coli</i>	Stool	OS	Osteomyelitis	B1_6F_W	DSMCPE189
P21	86/F	Jul-21	NDM-1	<i>E. coli</i>	Stool	GI-HB	C. difficile infection	B2_3F_N	DSMCPE188

P22	87/M	Jul-21	NDM-5	<i>E. coli</i>	Stool	GI-HB	Liver cancer	B2_3F_N	
P23	51/F	Jul-21	KPC-2	<i>K. pneumoniae</i>	Stool	GI-HB	Sigmoid volvulus	B2_3F_N	DSMCPE198
P24	84/M	Aug-21	NDM-1	<i>E. hormaechei</i>	urine	NEP	ESRD	B1_5F_E	DSMCPE190
P25	84/F	Aug-21	NDM-1	<i>E. coli</i>	Stool	NS	Cerebral infarct	B1_3F_W	
P26	78/F	Aug-21	NDM-1	<i>E. cloacae</i>	Stool	NEP	Hyponatremia	B2_6F_N	
P27	77/F	Aug-21	NDM-1	<i>C. portucalensis</i>	Stool	GY	Ovary cancer	B1_5F_ICU1	DSMCPE208
P28	46/F	Aug-21	NDM-1	<i>E. asburiae</i>	Stool	PUL	Aspiration pneumonia	B1_4F_E	DSMCPE210
P29	46/M	Sep-21	KPC-2	<i>K. pneumoniae</i>	Stool	CS/PU L	Acute leukemia	B1_5F_E	DSMCPE205
P30	61/F	Sep-21	NDM-1	<i>C. farmeri</i>	Stool	OS	Femur fracture	B1_7F_E	DSMCPE213
P31	62/F	Sep-21	NDM-1	<i>K. pneumoniae</i>	Stool	PUL	Pneumonia	B1_4F_E	DSMCPE211
P32	68/M	Sep-21	NDM-1	<i>E. asburiae</i>	Stool	INF	Tetanus	B1_5F_ICU2	
P33	66/M	Sep-21	KPC-2	<i>K. pneumoniae</i>	Stool	PUL	Pulmonary TB	B2_3F_N	DSMCPE238
P34	74/M	Sep-21	KPC-2	<i>K. pneumoniae</i>	Stool	GS	Cholangiocarcinoma	B2_3F_N	DSMCPE241
P36	75/M	Oct-21	KPC-2	<i>K. pneumoniae</i>	Blood	CV	Aortic aneurysm	B1_5F_E	DSMCPE239
P35	77/M	Oct-21	KPC-2	<i>K. pneumoniae</i>	Stool	CV	HCMP	B1_5F_E	DSMCPE240
P37	47/M	Oct-21	KPC-2	<i>K. pneumoniae</i>	Stool	CS	Lung abscess	B1_5F_E	
P38	57/M	Oct-21	NDM-1	<i>E. asburiae</i>	Stool	NEP	Pul thromboembolism	B2_6F_N	DSMCPE242
P39	78/M	Oct-21	KPC-2	<i>K. pneumoniae</i>	Stool	OS	Multiple myeloma	B1_6F_W	DSMCPE243
P40	77/M	Oct-21	KPC-2	<i>K. pneumoniae</i>	Stool	GS	Cholangiocarcinoma	B1_8F_W	DSMCPE244
P41	57/F	Oct-21	NDM-1	<i>E. coli</i>	Stool	NS	Hydrocephalus	B1_5F_ICU2	
P42	97/F	Nov-21	KPC-2	<i>K. pneumoniae</i>	Stool	CV	STEMI	B1_5F_E	DSMCPE245
P43	75/M	Nov-21	KPC-2	<i>K. pneumoniae</i>	Stool	NEP	Obstructive AKI	B1_5F_E	DSMCPE250
P44	77/F	Nov-21	KPC-2	<i>K. pneumoniae</i>	Stool	CV	DCMP	B1_5F_E	
P45	79/M	Nov-21	KPC-2	<i>K. pneumoniae</i>	Stool	PUL	Pulmonary aspergillosis	B1_4F_E	DSMCPE253

P46	78/F	Dec-21	KPC-2	<i>K. pneumoniae</i>	Stool	RM	Injury of spinal cord	B1_3F_E	DSMCPE264
P47	83/M	Dec-21	KPC-2	<i>K. pneumoniae</i>	Stool	NS	Subdural hematoma	B1_3F_E	
P48	67/F	Dec-21	NDM-1	<i>E. asburiae</i>	Blood	NS	ESRD, DFI	B1_5F_ICU2	DSMCPE298
P49	47/M	Jan-22	KPC-2	<i>C. koseri</i>	Stool	NS/RM	T-SDH	B1_8F_E	
P50	88/M	Jan-22	NDM-1	<i>E. asburiae</i>	blood	PUL	Heart failure, pneumonia	B2_5F_N	DSMCPE297
P51	63/M	Jan-22	NDM-5	<i>K. pneumoniae</i>	Stool	GI-HB	Decompensated LC	B2_3F_N	
P52	69/F	Mar-22	KPC-2	<i>K. pneumoniae</i>	Wound	OS	ESRD, DFI	B1_6F_W	
P53	78/F	Mar-22	KPC-2	<i>K. pneumoniae</i>	Stool	GI-HB	CBD cancer	B1_4F_E	DSMCPE290
P54	89/F	Mar-22	NDM-1	<i>K. pneumoniae</i>	Stool	OS	Decompensated LC, femur fracture	B1_7F_E	
P55	69/F	Mar-22	NDM-1	<i>K. pneumoniae</i>	Stool	OS	Radius fracture	B1_8F_E	
P56	49/F	Apr-22	KPC-2	<i>K. pneumoniae</i>	Stool	GI-HB	Decompensated LC	B2_3F_N	DSMCPE281
P57	60/M	Apr-22	KPC-2	<i>K. pneumoniae</i>	Stool	GI-HB	ESRD	B1_5F_ICU2	

Abbreviations: AKI, acute kidney injury; CPE, carbapenemase-producing Enterobacterales; CRE, carbapenem-resistant Enterobacterales; CS, chest surgery; CV, cardiovascular; DCMP, dilated cardiomyopathy; DFI, diabetic foot infection; ESRD, end-stage renal disease; GB, gall bladder; GI-HB, gastroenterology-hepatobiliary; GS, general surgery; GY, gynecology; HCMP, hypertrophic cardiomyopathy; HO, hematology-oncology; INF, infection; LC, liver cirrhosis; NEP, nephrology; NS, neurosurgery; OS, orthopedic surgery; PUL, pulmonology; RM, rehabilitation; TB, tuberculosis; URO, urology.

Table S2. Antibiotic non-susceptibility among CPE isolates and comparison between clinical and environmental isolates

	Clinical isolates (n=34)	Environmental isolates (n=27)	Total (n=61)	<i>p</i>-value
Imipenem				
High-level resistance ¹	14 (41.2%)	18 (66.7%)	32 (52.5%)	0.048
Meropenem				
High-level resistance ¹	23 (67.6%)	20 (74.1%)	43 (70.5%)	0.585
Ertapenem				
High-level resistance ¹	24 (70.6%)	18 (66.7%)	42 (68.9%)	0.743
Ciprofloxacin	23 (67.6%)	24 (88.9%)	47 (77.0%)	0.05
Levofloxacin	23 (67.6%)	24 (88.9%)	47 (77.0%)	0.05
Amikacin	7 (20.6%)	13 (48.1%)	20 (32.8%)	0.023
Gentamicin	20 (58.8%)	12 (44.4%)	32 (52.5%)	0.264
Colistin	8 (23.5%)	17 (63.0%)	25 (41.0%)	0.002
Aztreonam	27 (79.4%)	21 (77.8%)	48 (78.7%)	0.877
Cefotaxime	34 (100.0%)	27 (100.0%)	61 (100.0%)	
Cefepime	34 (100.0%)	25 (92.6%)	59 (96.7%)	0.107
Piperacillin/tazobactam	34 (100%)	26 (96.3%)	60 (98.4%)	0.258
Fosfomycin	14 (41.2%)	12 (44.4%)	26 (42.6%)	0.798
Tetracycline	23 (67.6%)	10 (37.0%)	33 (54.1%)	0.017
Tigecycline	13 (38.2%)	10 (37.0%)	23 (37.7%)	0.924
TMP/SMX	18 (52.9%)	11 (40.7%)	29 (47.5%)	0.343

¹All isolates were resistant to carbapenems (imipenem, meropenem, ertapenem) and high-level resistance to carbapenem was defined as MIC $\geq$ 32 mg/L.

Abbreviations: CPE, carbapenemase-producing Enterobacterales; TMP/SMX, trimethoprim/sulfamethoxazole

Table S3. Epidemiologic and genomic characteristics of CPE isolates available for whole genome sequencing

Sample ID	Month	Category	Location*	Sample source	Species	Carbapenemase	ST	SNP based clade	Plasmid carrying <i>bla</i> _{NDM-1}
DSMCPE23	Jul-19	HO	B1_7F_E	Urine	<i>C. freundii</i>	KPC-4	265	ST265 C1	
DSMCPE102	Mar-20	HO	B1_3F_E	Stool	<i>C. freundii</i>	KPC-4	265	ST265 C1	
DSMCPE115	Jan-21	HO	B1_5F_E	Stool	<i>K. pneumoniae</i>	KPC-2	307	ST307 S	
DSMCPE116	Jan-21	HA	B2_5F_N	Stool	<i>K. pneumoniae</i>	KPC-2	307	ST307 C3	
DSMCPE127	Feb-21	Env	B1_5F_ICU2	HW sink	<i>E. cloacae</i>	VIM-2	928		
DSMCPE128*	Feb-21	Env	B1_5F_ICU1	HW sink	<i>E. hormaechei</i>	NDM-1	127		pDSMCPE8.2
DSMCPE134	Feb-21	Env	B2_3F_N	HW sink (P)	<i>K. pneumoniae</i>	KPC-2	307	ST307 C1	
DSMCPE136*	Feb-21	Env	B2_3F_N	Disposal sink	<i>K. pneumoniae</i>	KPC-4; VIM-1	3680		
DSMCPE137	Feb-21	Env	B2_3F_N	Disposal sink	<i>E. asburiae</i>	NDM-1	252	ST252 S	pDSMCPE8.2
DSMCPE142	Mar-21	HA	B2_3F_N	Stool	<i>K. pneumoniae</i>	KPC-2	392		
DSMCPE145*	Mar-21	Env	B1_6F_W	Utility sink	<i>E. asburiae</i>	NDM-1	484	ST484 S	pDSMCPE145.3
DSMCPE152	May-21	HA	B1_3F_W	Stool	<i>C. freundii</i>	NDM-1	481		pDSMCPE8.2
DSMCPE153	May-21	HA	B2_6F_N	Stool	<i>K. pneumoniae</i>	NDM-1	2044		pDSMCPE168.3
DSMCPE155	Apr-21	HA	B2_3F_N	Stool	<i>K. pneumoniae</i>	KPC-2	48		
DSMCPE166	Jun-21	Env	B1_3F_E	Disposal sink	<i>C. freundii</i>	KPC-4	265	ST265 C1	
DSMCPE167	Jun-21	Env	B1_7F_W	HW sink	<i>K. pneumoniae</i>	KPC-2	307	ST307 C3	
DSMCPE168*	Jun-21	Env	B2_6F_N	Utility sink	<i>E. asburiae</i>	NDM-1	484	ST484 C2	pDSMCPE168.3
DSMCPE169	Jun-21	Env	B2_6F_N	Disposal sink	<i>C. portucalensis</i>	NDM-1	552		pDSMCPE8.2
DSMCPE170*	Jun-21	Env	B2_6F_N	Disposal sink	<i>E. asburiae</i>	NDM-1	484	ST484 C2	pDSMCPE168.3
DSMCPE172*	Jun-21	Env	B2_6F_N	HW sink	<i>E. asburiae</i>	NDM-1	484	ST484 C2	pDSMCPE168.3

DSMCPE173*	Jun-21	Env	B2_5F_N	HW sink (P)	<i>E. asburiae</i>	NDM-1	484	ST484 C1	pDSMCPE168.3
DSMCPE178	Jun-21	Env	B1_4F_E	HW sink	<i>K. pneumoniae</i>	KPC-2	11	ST11 C1	
DSMCPE179	Jun-21	HO	B1_5F_ICU1	Stool	<i>C. freundii</i>	NDM-1	481		pDSMCPE8.2
DSMCPE180	Jun-21	HA	B1_8F_E	Stool	<i>C. braakii</i>	NDM-1	NT		pDSMCPE8.2
DSMCPE183	May-21	HA	B1_4F_E	Stool	<i>K. pneumoniae</i>	KPC-2	307	ST307 C3	
DSMCPE187	Jul-21	HA	B2_5F_N	Stool	<i>E. hormaechei</i>	NDM-1	61		pDSMCPE8.2
DSMCPE188	Jul-21	HA	B2_3F_N	Stool	<i>E. coli</i>	NDM-1	10745		pDSMCPE8.2
DSMCPE189	Jul-21	HA	B1_6F_W	Stool	<i>E. coli</i>	NDM-1	448		pDSMCPE8.2
DSMCPE190	Aug-21	HO	B1_5F_E	Urine	<i>E. hormaechei</i>	NDM-1	61		pDSMCPE8.2
DSMCPE198	Jul-21	HA	B2_3F_N	Stool	<i>K. pneumoniae</i>	KPC-2	307	ST307 C3	
DSMCPE205	Sep-21	HO	B1_5F_E	Stool	<i>K. pneumoniae</i>	KPC-2	307	ST307 C2	
DSMCPE208	Aug-21	HO	B1_5F_ICU1	Stool	<i>C. portucalensis</i>	NDM-1	493		pDSMCPE8.2
DSMCPE210	Aug-21	HA	B1_4F_E	Stool	<i>E. asburiae</i>	NDM-1	484	ST484 S	pDSMCPE8.2
DSMCPE211	Sep-21	HA	B1_4F_E	Stool	<i>K. pneumoniae</i>	NDM-1	196		pDSMCPE8.2
DSMCPE213	Sep-21	HA	B1_7F_E	Stool	<i>C. farmeri</i>	NDM-1	686		pDSMCPE8.2
DSMCPE215*	Jun-21	Env	B1_5F_E	Utility sink	<i>E. asburiae</i>	NDM-1	484	ST484 C1	pDSMCPE168.3
DSMCPE218*	Jun-21	Env	B1_5F_E	HW sink	<i>E. asburiae</i>	NDM-1	252	ST252 C1	pDSMCPE8.2
DSMCPE223*	Jun-21	Env	B1_7F_E	Disposal sink	<i>E. asburiae</i>	NDM-1	252	ST252 C1	pDSMCPE8.2
DSMCPE225*	Jun-21	Env	B1_8F_W	HW sink	<i>S. marcescens</i>	NDM-1, IMP-1	NT		pDSMCPE8.2
DSMCPE227	Aug-21	Env	B1_4F_E	HW sink	<i>K. pneumoniae</i>	KPC-2	11	ST11 C1	
DSMCPE228*	Aug-21	Env	B2_3F_N	Disposal sink	<i>K. quasipneumo</i>	NDM-1	196		pDSMCPE8.2
DSMCPE229	Aug-21	Env	B2_3F_N	Disposal sink	<i>C. freundii</i>	KPC-4	265	ST265 C1	
DSMCPE233*	Aug-21	Env	B2_6F_N	HW sink	<i>C. portucalensis</i>	NDM-1	552		pDSMCPE8.2
DSMCPE235	Aug-21	Env	B2_5F_N	Disposal sink	<i>E. asburiae</i>	NDM-1	484	ST484 C2	pDSMCPE168.3

DSMCPE236*	Aug-21	Env	B1_5F_ICU2	HW sink (P)	<i>P. diazotrophicus</i>	NDM-1	NT		pDSMCPE168.3
DSMCPE238	Sep-21	HA	B2_3F_N	Stool	<i>K. pneumoniae</i>	KPC-2	307	ST307 C2	
DSMCPE239	Sep-21	HO	B1_5F_E	Stool	<i>K. pneumoniae</i>	KPC-2	307	ST307 C3	
DSMCPE240	Oct-21	HO	B1_5F_E	Stool	<i>K. pneumoniae</i>	KPC-2	307	ST307 C3	
DSMCPE241	Sep-21	HA	B2_3F_N	Stool	<i>K. pneumoniae</i>	KPC-2	307	ST307 C3	
DSMCPE242	Oct-21	HO	B2_6F_N	Stool	<i>E. asburiae</i>	NDM-1	484	ST484 C2	pDSMCPE168.3
DSMCPE243	Oct-21	HO	B1_6F_W	Stool	<i>K. pneumoniae</i>	KPC-2	11	ST11 S	
DSMCPE244	Oct-21	HA	B1_8F_W	Stool	<i>K. pneumoniae</i>	KPC-2	307	ST307 C2	
DSMCPE245	Nov-21	HO	B1_5F_E	Stool	<i>K. pneumoniae</i>	KPC-2	307	ST307 C3	
DSMCPE250	Nov-21	HO	B1_5F_E	Stool	<i>K. pneumoniae</i>	KPC-2	307	ST307 C1	
DSMCPE253	Nov-21	HO	B1_4F_E	Stool	<i>K. pneumoniae</i>	KPC-2	307	ST307 C3	
DSMCPE258	Aug-21	Env	B1_7F_E	Disposal sink	<i>C. amaloaticus</i>	IMP-1	573		
DSMCPE261	Dec-21	Env	B2_5F_N	Disposal sink	<i>E. asburiae</i>	NDM-1	484	ST484 C2	pDSMCPE168.3
DSMCPE262	Dec-21	Env	B2_6F_N	HW sink	<i>E. asburiae</i>	NDM-1	484	ST484 C2	pDSMCPE168.3
DSMCPE264	Dec-21	HO	B1_3F_E	Stool	<i>K. pneumoniae</i>	KPC-2	307	ST307 C1	
DSMCPE297	Jan-22	HO	B2_5F_N	Blood	<i>E. asburiae</i>	NDM-1	484	ST484 C2	pDSMCPE168.3
DSMCPE298	Dec-21	HO	ICU2	Blood	<i>E. asburiae</i>	NDM-1	484	ST484 C2	pDSMCPE168.3

Asterix (*) indicates previously published isolates [2]. Abbreviations: C, clade; Env, environment; HA, hospital-associated; HO, hospital-onset; HW sink, hand-washing sink in nurse station; HW sink (P), hand-washing sink in patient room/area; NT, non-typable; S, singleton; SNP, single nucleotide polymorphism; ST, sequence type; disposal sink, IV fluid disposal sink.

Table S4. Plasmid replicons and antimicrobial resistance genes other than carbapenemase genes among CPE isolates investigated in this study

Sample ID	Plasmid replicons	Other - β -lactamases	ARGs against fluoroquinolone	ARGs against aminoglycosides	Other ARGs
DSMCPE23	IncFIB(pHCM2), IncFIB(pECLA), IncFII(pECLA), Col440I	CMY-181, OXA-1, TEM-1	qnrA1, aac(6')-Ib-cr5	aac(6')-Ib-cr5, aadA5	mph(A), mrx(A), arr-3, catA1, catB3, dfrA17, sul1, tet(B)
DSMCPE102	IncFIB(pHCM2), IncFIB(pECLA), IncFII(pECLA), Col440I	CMY-181, OXA-1, TEM-1	aac(6')-Ib-cr5	aac(6')-Ib-cr5, aadA5	mph(A), mrx(A), arr-3, catA1, catB3, dfrA17, sul1, tet(B), qacEdelta1
DSMCPE115	IncFIB(K), IncFII(K), IncX3	CTX-M-15, OXA-1, TEM-1B	qnrB1, aac(6')-Ib-cr	aac(3)-IIa, aac(6')-Ib-cr, aph(3'')-Ib, aph(6)-Id	dfrA14, fosA6, sul2, tet(A)
DSMCPE116	IncFIB(K), IncFII(K), IncN, IncX3	CTX-M-15, SHV-182, OXA-1, TEM-1B	qnrB1, aac(6')-Ib-cr	aac(3)-IIa, aac(6')-Ib-cr, aph(3'')-Ib, aph(6)-Id	dfrA14, fosA6, sul2
DSMCPE127	Col(IRGK), IncC, IncFIB(pECLA), IncFII(pECLA), pKPC-CAV1321	OXA-2, TEM-1B		aac(6')-Ib11, aph(3'')-Ib, aph(6)-Id	catA2, sul1, sul2, qacEdelta1
DSMCPE128*	IncFIB(pECLA), IncHI2, IncHI2A, IncL, IncX3	ACT-16, OXA-2, TEM-1B	qnrS1	aac(6')-31, ant(2'')-Ia, aph(3'')-Ib, aph(6)-Id	mcr-10.1, catB3, dfrA14, fosA, sul1, sul2, qacEdelta1
DSMCPE134	IncFIB(K)-IncFII(K), IncN, IncX3	CTX-M-15, OXA-1, TEM-1B	qnrB1, aac(6')-Ib-cr	aac(3)-IIa, aac(6')-Ib-cr, aph(3'')-Ib, aph(6)-Id	dfrA14, fosA6, sul2, tet(A)
DSMCPE136*	IncHI5B	CTX-M-15, SHV-172, OXA-2, TEM-1B	qnrS1		fosA, sul1, qacEdelta1
DSMCPE137	Col(IRGK), IncFIB(K), IncFII(pECLA), IncX3, repE(pEh60-7)	CTX-M-3, ACT-3	qnrE1	aadA2	fosA, qacEdelta1
DSMCPE142	Col(pHAD28), IncFIB(pNDM-Mar), IncFII(K), repB(R1701)	DHA-1, TEM-122, OXA-4, OXA-9, SHV-11	qnrB4, qnrS1	aadA2	fosA, sul1, qacEdelta1
DSMCPE145*	IncFIB(pECLA), IncFIB(pQil), IncFII(pECLA), IncX3	ACT-6, OXA-4		aac(6')-Ib, aac(6')-IIc, aadA2b, aph(3'')-Ib, aph(3')-Ia, aph(6)-Id	mcr-10, dfrA19, ere(A), sul1

DSMCPE152	IncX3, pKPC-CAV1321	CMY-84	qnrB		mcr-9
DSMCPE153	IncX3	SHV-187			fosA6
DSMCPE155	Col(pHAD28), IncFII(K), IncR, IncX3, repB_KLEB	CTX-M-15, SHV-182 OXA-1, TEM-1B	qnrB1, aac(6')-Ib-cr	aac(3)-IIa, aac(6')-Ib-cr, aph(3'')-Ib	fosA, sul28, tet(A)
DSMCPE166	IncFIB(pHCM2), IncFIB(pECLA), IncFII(pECLA)	CMY-135, OXA-1, TEM-1B	aac(6')-Ib-cr	aac(6')-Ib-cr, aadA5	catA1, catB3, dfrA17, mph(A), sul1, tet(B), arr-3, qacEdelta1
DSMCPE167	IncFIB(K)--IncFII(K), IncX3	CTX-M-15, SHV-106, OXA-1, TEM-1B	qnrB1, aac(6')-Ib-cr	aac(3)-IIa, aac(6')-Ib-cr, aph(3'')-Ib, aph(6)-Id	dfrA14, fosA6, sul2
DSMCPE168*	IncFIB(pECLA), IncFII(pECLA), IncX3, repB(R1701)	SHV-12, ACT-145	qnrS1		mcr-9, fosA
DSMCPE169	IncX3	CMY-183	qnrB2	aadA2, aph(3'')-Ib, aph(6)-Id	mcr-9, sul1, qacEdelta1
DSMCPE170*	IncFIB(pECLA), IncFII(pECLA), IncX3, repB(R1701)	SHV-12, ACT-145	qnrS1		mcr-9, fosA
DSMCPE172*	IncFIB(pECLA), IncFII(pECLA), IncX3, repB(R1701)	SHV-12, ACT-145	qnrS1		mcr-9, fosA
DSMCPE173*	IncFIB(pECLA), IncFII(pECLA), IncX3	SHV-12, ACT-145	qnrB2	aadA2	mcr-9, fosA, sul1, qacEdelta1
DSMCPE178	ColRNAI, IncFIB(K), IncFII(K), IncFII(pHN7A8), IncR	SHV-182, TEM-1B		aadA2, rmtB	catA2, fosA6, qacEdelta1
DSMCPE179	IncN, IncX3, pKPC-CAV1321	CTX-M-15, CMY-84, TEM-1B	qnrB, qnrS1		mcr-9
DSMCPE180	IncFII(pEH01), IncX3	CMY-101	qnrB67		
DSMCPE183	IncFIB(K), IncFII(K), IncX3	CTX-M-15, SHV-182, OXA-1, TEM-1B	qnrB1, aac(6')-Ib-cr	aac(3)-IIa, aac(6')-Ib-cr, aph(3'')-Ib, aph(6)-Id	dfrA14, fosA6, sul2
DSMCPE187	IncFIB(pECLA), IncFII(pECLA), IncX3	CTX-M-15, ACT-7, OXA-1	qnrB1, aac(6')-Ib-cr	aac(3)-IIa, aac(6')-Ib-cr	catA1, dfrA14, tet(A)
DSMCPE188	IncFIB(K), IncFII(Yp), IncX3				mdf(A)
DSMCPE189	IncFIA, IncI1-I(Alpha), IncX3, p0111				mdf(A)

DSMCPE190	IncFIB(pECLA), IncFII(pECLA), IncX3	CTX-M-15, ACT-7, OXA-1	qnrB1, aac(6')-Ib-cr	aac(3)-IIa, aac(6')-Ib-cr	catA1, dfrA14, tet(A)
DSMCPE198	IncFIB(K), IncFII(K), IncX3	CTX-M-15, SHV-182, TEM-1B	qnrB1, aac(6')-Ib-cr	aac(3)-IIa, aac(6')-Ib-cr, aph(3'')-Ib, aph(6)-Id	dfrA14, fosA6, sul2
DSMCPE205	IncFIB(pQil), IncFII(K)	SHV-106, OXA-9, TEM-1A			fosA6
DSMCPE208	IncX3	CMY-2	qnrB32		
DSMCPE210	IncFIB(pECLA), IncFII(pECLA), IncX3	ACT-7, DHA-1	qnrB4	aph(3'')-Ib, aph(6)-Id	mcr-9, dfrA19, fosA, sul1
DSMCPE211	IncFIB(K), IncN, IncX3	CTX-M-3, OKP-A-5	qnrS1		dfrA14, fosA6, tet(D)
DSMCPE213	IncX3, pKPC-CAV1321				mcr-9, mdx(A)
DSMCPE215*	IncFIB(pECLA), IncFII(pECLA), IncX3	CTX-M-3, SHV-12, ACT-145	qnrB2	aadA2, aph(3'')-Ib, aph(6)-Id	mcr-9, dfrA19, fosA, sul1, qacEdelta1
DSMCPE218*	Col(IRGK), IncFIB(K), IncFII(pECLA), IncX3, repE(pEh60-7)	CTX-M-3, ACT-3	qnrE1	aadA2	fosA, qacEdelta1
DSMCPE223*	Col(IRGK), IncFIB(K), IncFII(pECLA), IncX3, repE(pEh60-7)	CTX-M-3, ACT-3	qnrE1	aadA2	fosA, qacEdelta1
DSMCPE225*	IncFIB(K), IncX3			aac(6')-IIa, aac(6')-Ic, aac(6')-II	tet(41), qacG2
DSMCPE227	ColRNAI, IncFIB(K), IncFII(K), IncFII(pHN7A8), IncR	SHV-182, TEM-1B		aadA2, rmtB	catA2, fosA6, qacEdelta1
DSMCPE228*	IncFIB(K), IncN, IncX3	CTX-M-3, OKP-A-5	qnrS1		dfrA14, fosA6, tet(D)
DSMCPE229	IncFIB(pHCM2), IncFIB(pECLA), IncFII(pECLA)	CMY-135, OXA-1, TEM-1B	aac(6')-Ib-cr	aac(6')-Ib-cr, aadA5	catA1, catB3, dfrA17, mph(A), sul1, tet(B), arr-3, qacEdelta1
DSMCPE233*	IncX3	CMY-183	qnrB2	aadA2, aph(3'')-Ib, aph(6)-Id	mcr-9, sul1, qacEdelta1
DSMCPE235	IncFIB(pECLA), IncFII(pECLA), IncHI2, IncHI2A, IncX3, repB(R1701)	CTX-M-9, SHV-12, ACT-145	qnrS1	aadA2, ant(2'')-Ia	mcr-9, fosA, sul1, qacEdelta1
DSMCPE236*	IncX3	SHV-12, OXA-2, TEM-1B	qnrS1	aac(6')-31, ant(2'')-Ia	catB3, sul1, qacEdelta1

DSMCPE238	IncFIB(pQil), IncFII(K)	SHV-106, OXA-9, TEM-1A			fosA6
DSMCPE239	IncFIB(K), IncFII(K), IncN, IncX3	CTX-M-15, SHV-182, OXA-1, TEM-1B	qnrB1, aac(6')- Ib-cr	aac(3)-IIa, aac(6')-Ib-cr, aadA16, aph(3'')-Ib, aph(6)- Id	dfrA14, dfrA27, fosA6, sul1, sul2, arr-3, qacEdelta1
DSMCPE240	IncFIB(K), IncFII(K), IncL, IncX3	CTX-M-15, SHV-182, OXA-1, TEM-1B	qnrB1, aac(6')- Ib-cr	aac(3)-IIa, aac(6')-Ib-cr, aph(3'')-Ib, aph(6)-Id	dfrA14, fosA6, sul2, tet(A)
DSMCPE241	IncFIB(K), IncFII(K), IncX3	CTX-M-15, SHV-182, OXA-1, TEM-1B	qnrB1, aac(6')- Ib-cr	aac(3)-IIa, aac(6')-Ib-cr, aph(3'')-Ib, aph(6)-Id	dfrA14, fosA6, sul2, tet(A)
DSMCPE242	IncFIB(pECLA), IncFII(pECLA), IncX3, repB(R1701)	SHV-12, ACT-145	qnrS1		mcr-9, fosA
DSMCPE243	Col(pHAD28), IncFIB(K), IncFIB(pQil), IncFII(K), IncFII(K), IncN	SHV-182, OXA-9, TEM-1A	qnrB6: aac(6')- Ib-cr	aac(6')-Ib-cr, aadA16	dfrA27, fosA6, sul1, tet(A), arr-3, qacEdelta1
DSMCPE244	IncFIB(K), IncFIB(pQil), IncFII(K), IncFII(K)	CTX-M-15, SHV-106, OXA-1, OXA-9, TEM- 1A	qnrB1, aac(6')- Ib-cr	aac(3)-IIa, aac(6')-Ib-cr, aph(3'')-Ib, aph(6)-Id	dfrA14, fosA6, sul2, tet(A)
DSMCPE245	IncFIB(K), IncFII(K), IncX3	CTX-M-15, SHV-182, OXA-1, TEM-1B	qnrB1, aac(6')- Ib-cr	aac(3)-IIa, aac(6')-Ib-cr, aph(3'')-Ib, aph(6)-Id	dfrA14, fosA6, sul2
DSMCPE250	IncFIB(K), IncFII(K)	CTX-M-15, SHV-106, TEM-1B	qnrB1	aph(3'')-Ib, aph(6)-Id	dfrA14, fosA6, sul2
DSMCPE253	IncFIB(K), IncFII(K), IncX3	CTX-M-15, OXA-1, TEM-1B	qnrB1, aac(6')- Ib-cr	aac(3)-IIa, aac(6')-Ib-cr, aph(3'')-Ib, aph(6)-Id	dfrA14, fosA6, sul2
DSMCPE258	IncL/M2, IncX2, Col440I	CTX-M-3, TEM-1B	qnrS1	aac(6')-IIa, aac(6')-II	dfrA14, mdx(A), tet(A)
DSMCPE261	IncFIB(pECLA), IncFII(pECLA), IncHI2, IncHI2A, IncX3, repB(R1701)	CTX-M-9, SHV-12, ACT-145	qnrS1	aadA2, ant(2'')-Ia	mcr-9, fosA, sul1, qacEdelta1
DSMCPE262	IncFIB(pECLA), IncFII(pECLA), IncX3, repB(R1701)	SHV-12, ACT-145	qnrS1		mcr-9, fosA
DSMCPE264	IncFIB(K), IncFII(K)	CTX-M-15, SHV-106 TEM-1B	qnrB1	aph(3'')-Ib, aph(6)-Id	dfrA14, fosA6, sul2
DSMCPE297	IncFIB(pECLA), IncFII(pECLA), IncX3	SHV-12, ACT-145			mcr-9, fosA

DSMCPE298	IncFIB(pECLA), IncFII(pECLA), IncX3, repB(R1701)	SHV-12, ACT-145	qnrS1	mcr-9, fosA
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Asterix (*) indicates previously published isolates [2]. Abbreviations: ARG, antimicrobial resistance gene; CPE, carbapenemase-producing Enterobacterales

Table S5. Assembly quality of CPE isolates investigated in this study

Sample ID	Sequencing methods	Assembly quality					Assembly method
		# contigs	Largest contig	Total length	GC (%)	N50	
DSMCPE23	Illumina	75	647,413	5,284,602	51.8	211,843	Spades
DSMCPE102	Illumina	87	871,192	5,280,364	51.8	191,759	Spades
DSMCPE115	Illumina	73	679,328	5,711,658	57.0	269,500	Spades
DSMCPE116	Illumina	90	435,481	5,787,552	56.9	200,607	Spades
DSMCPE127	Illumina	88	693,604	5,226,123	53.1	230,760	Spades
DSMCPE128*	Illumina	7	4,601,337	5,110,290	54.7	4,601,337	Unicycler
DSMCPE134	PacBio	71	509,028	5,574,838	57.1	307,139	Unicycler
DSMCPE136*	Illumina	4	5,315,692	5,807,706	56.7	5,315,692	Unicycler
DSMCPE137	PacBio	87	325,749	4,870,763	55.5	168,275	Spades
DSMCPE142	Illumina	93	429,537	5,661,021	56.8	154,759	Spades
DSMCPE145*	Illumina	6	4,977,446	5,348,850	55.3	4,977,446	Unicycler
DSMCPE152	PacBio	130	466,248	5,301,693	51.6	111,150	Unicycler
DSMCPE153	Illumina	29	773,164	5,216,317	57.5	441,506	Unicycler
DSMCPE155	Illumina	101	293,634	5,674,401	56.9	122,186	Spades
DSMCPE166	Illumina	6	5,047,344	5,312,827	51.8	5,047,344	Unicycler
DSMCPE167	PacBio	77	735,754	5,754,183	57.0	269,252	Spades
DSMCPE168*	Illumina	6	4,857,531	5,129,350	55.5	4,857,531	Unicycler
DSMCPE169	PacBio	62	833,208	5,132,868	51.8	244,220	Unicycler
DSMCPE170*	Illumina	90	535,448	4,998,904	55.6	195,607	Spades
DSMCPE172*	Illumina	93	535,568	4,997,275	55.6	195,607	Spades
DSMCPE173*	Illumina	93	440,616	5,089,426	55.5	180,697	Spades
DSMCPE178	Illumina	4	5,434,428	5,792,538	57.0	5,434,428	Unicycler
DSMCPE179	PacBio	146	466,248	5,332,880	51.6	107,786	Unicycler
DSMCPE180	Illumina	35	1,143,689	5,010,386	51.9	421,468	Unicycler
DSMCPE183	Illumina	92	345,754	5,756,698	57	216,028	Spades
DSMCPE187	Illumina	79	481,381	4,756,709	55.5	217,845	Unicycler
DSMCPE188	Illumina	90	304,753	4,814,811	50.7	118,518	Spades
DSMCPE189	Illumina	113	356,673	5,119,197	50.6	135,090	Unicycler
DSMCPE190	Illumina	77	544,294	4,747,566	55.5	181,241	Unicycler
DSMCPE198	Illumina	80	413,009	5,663,161	57.0	222,065	Spades
DSMCPE205	Illumina	71	397,050	5,543,903	57.2	166,435	Spades
DSMCPE208	Illumina	59	701,955	4,925,810	51.9	202,964	Unicycler
DSMCPE210	Illumina	112	563,280	5,019,891	55.4	151,410	Spades

DSMCPE211	Illumina	88	533,525	5,688,770	57.7	159,877	Spades
DSMCPE213	Illumina	62	1,094,146	5,479,626	52.7	477,719	Unicycler
DSMCPE215*	Illumina	78	671,738	5,003,704	55.5	195,607	Spades
DSMCPE218*	Illumina	102	592,232	4,901,103	55.5	171,835	Spades
DSMCPE223*	Illumina PacBio	5	5,181,427	5,435,553	51.8	5,181,427	Unicycler
DSMCPE225*	Illumina	58	842,121	5,368,142	59.3	323,026	Spades
DSMCPE227	Illumina	110	353,840	5,660,357	57.1	116,873	Spades
DSMCPE228*	Illumina	66	579,988	5,687,635	57.7	220,884	Spades
DSMCPE229	Illumina	75	868,864	5,251,904	51.8	233,263	Unicycler
DSMCPE233*	Illumina	71	472,548	5,165,432	51.8	324,847	Spades
DSMCPE235	Illumina	146	358,009	5,254,641	55.1	145,426	Spades
DSMCPE236*	Illumina	83	442,526	5,940,652	53.0	163,589	Spades
DSMCPE238	Illumina	71	557,259	5,542,912	57.2	142,316	Spades
DSMCPE239	Illumina	102	413,006	5,802,227	56.9	266,055	Spades
DSMCPE240	Illumina	102	640,329	5,825,394	56.9	180,363	Spades
DSMCPE241	Illumina	102	345,754	5,761,639	57.0	180,363	Spades
DSMCPE242	Illumina	98	535,208	4,975,361	55.6	195,317	Spades
DSMCPE243	Illumina	162	375,234	5,648,861	57.2	120,404	Spades
DSMCPE244	Illumina	96	649,292	5,745,136	57.1	211,380	Spades
DSMCPE245	Illumina	76	657,239	5,666,947	57.0	203,958	Spades
DSMCPE250	Illumina	69	650,656	5,633,585	57.2	184,373	Spades
DSMCPE253	Illumina	132	372,327	5,772,110	57.0	118,997	Spades
DSMCPE258	Illumina	65	619,849	5,111,888	53.4	366,119	Unicycler
DSMCPE261	Illumina	127	535,208	5,201,333	55.1	195,750	Unicycler
DSMCPE262	Illumina	96	535,208	4,982,540	55.6	195,693	Unicycler
DSMCPE264	Illumina	64	650,541	5,632,207	57.2	200,081	Spades
DSMCPE297	Illumina	95	397,307	4,945,956	55.6	133,418	Spades
DSMCPE298	Illumina	119	397,307	4,996,515	55.6	147,861	Spades

Asterix (*) indicates previously published isolates [2].

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