Supplementary Table S1. Antibiotic list in this study

No	Drug class	Drugname
1	Aminoglycosides	Amikacin
2	Aminoglycosides	Daguanmycin
3	Aminoglycosides	Etymicin
4	Aminoglycosides	Ipamycin
5	Aminoglycosides	Kanamycin
6	Aminoglycosides	Netimicin
7	Aminoglycosides	Tobramycin
8	Amphenicols	chloramphenicol
9	Amphenicols	Thiamphenicol
10	Amphenicols	Thiomycin glycine ester
11	Carbapenems	Biapenem
12	Carbapenems	Etapenem
13	Carbapenems	Faropenem
14	Carbapenems	Imipenem cilastatin
15	Carbapenems	Meropenem
16	Carbapenems	Panipenem and Betamipron
17	Cephalosporins	Cefaclor
18	Cephalosporins	Cefacoxime
19	Cephalosporins	Cefadizine
20	Cephalosporins	Cefaladine
21	Cephalosporins	Cefazoxime
22	Cephalosporins	Cefdinib
23	Cephalosporins	Cefditoren Pivoxil
24	Cephalosporins	Cefepime
25	Cephalosporins	Cefmondo
26	Cephalosporins	Cefominol
27	Cephalosporins	Cefomizole
28	Cephalosporins	Cefomontol ester
29	Cephalosporins	Cefonidazole
30	Cephalosporins	Cefoperamide
31	Cephalosporins	Cefoperazole
32	Cephalosporins	Cefoperazone
33	Cephalosporins	Cefoperazone
34	Cephalosporins	cefoperazone
35	Cephalosporins	Cefoperazone
36	Cephalosporins	Cefotaxil
37	Cephalosporins	Cefotaxime
38	Cephalosporins	Cefotaxime
39	Cephalosporins	Cefotaxiphene
40	Cephalosporins	Cefotiam
41	Cephalosporins	Cefoxitin
42	Cephalosporins	Cefpirol

No	Drug class	Drugname
43	Cephalosporins	Cefpodoxime axetil
44	Cephalosporins	Ceftamet axetil
45	Cephalosporins	Ceftazidime
46	Cephalosporins	Ceftazolin
47	Cephalosporins	Cefthiamidine
48	Cephalosporins	Ceftriaxone
49	Cephalosporins	Ceftriaxone Neopentyl Ester
50	Cephalosporins	Cefuroxil
51	Cephalosporins	Cefuroxime
52	Cephalosporins	Cefuroxime axetil
53	Cephalosporins	Cephalosporin
54	Cephalosporins	Cephalosporin and trimethoprim
55	Cephalosporins	Cephalosporin Propylene
56	Cephalosporins	Compound Cefaclor
57	Cephalosporins	Fluorocephalin
58	Cephalosporins	Laxocephalosporin
59	Lincomycin & Clindamycin	Clindamycin
60	Lincomycin & Clindamycin	Clindamycin palmitate
61	Lincomycin & Clindamycin	Lincomycin
62	Macrolides	Acetyl Guitarimycin
63	Macrolides	Acetyl Medimycin
64	Macrolides	Acetylspiramycin
65	Macrolides	Amphotericin B
66	Macrolides	Amphotericin B cholesterol sulfate
67	Macrolides	Amphotericin B liposomes
68	Macrolides	Azithromycin
69	Macrolides	Benzathine penicillin
70	Macrolides	Clarithromycin
71	Macrolides	Cyclic ester erythromycin
72	Macrolides	Erythromycin
73	Macrolides	erythromycin
74	Macrolides	Erythromycin ethylsuccinate
75	Macrolides	gentamicin
76	Macrolides	Guitarimycin
77	Macrolides	Jiaoxamycin
78	Macrolides	Medimycin
79	Macrolides	Penicillin G potassium
80	Macrolides	Penicillin G sodium
81	Macrolides	Penicillin V potassium
82	Macrolides	Procaine penicillin
83	Macrolides	Relying on erythromycin
84	Macrolides	Roxithromycin
85	Macrolides	Roxithromycin ambroxol

No	Drug class	Drugname
86	Macrolides	Spiramycin
87	Macrolides	streptomycin
88	Macrolides	Xiaonuomicin
89	Oxazolidinones	Comtizolamide
90	Oxazolidinones	Linazolamide
91	Penicillin	Aloxicillin
92	Penicillin	amoxicillin
93	Penicillin	Amoxicillin and Diclofenac
94	Penicillin	Amoxicillin and flucloxacillin
95	Penicillin	Amoxicillin clavulanate potassium
96	Penicillin	ampicillin
97	Penicillin	Ampicillin and Cloxacillin
98	Penicillin	Ampicillin probenecid
99	Penicillin	Benzoxacillin
100	Penicillin	Carboxybenzylpenicillin
101	Penicillin	Cloxacillin
102	Penicillin	Flucloxacillin
103	Penicillin	Furbenicillin
104	Penicillin	Lenampicillin
105	Penicillin	Meloxicillin
106	Penicillin	Navacillin
107	Penicillin	Piperacillin
108	Penicillin	Sodium ticarcillin and potassium clavulanate
109	Penicillin	Sulfamethoxazole
110	Penicillin	Sultamicillin
111	Polymyxin	Myxin
112	Polymyxin	Polymyxin B
113	Polymyxin	Polymyxin E
114	Quinolones	Antifloxacin
115	Quinolones	Balofloxacin
116	Quinolones	ciprofloxacin
117	Quinolones	Enoxacin
118	Quinolones	Fluroxacin
119	Quinolones	Gatifloxacin
120	Quinolones	Jimifloxacin
121	Quinolones	Levofloxacin
122	Quinolones	Lomefloxacin
123	Quinolones	Moxifloxacin
124	Quinolones	Nerofloxacin
125	Quinolones	norfloxacin
126	Quinolones	Ofloxacin
127	Quinolones	Pazufloxacin
128	Quinolones	Pipemidic acid

No	Drug class	Drugname
129	Quinolones	Sparfloxacin
130	Quinolones	Tofloxacin
131	Quinolones	Xitafloxacin
132	Sulfonamides	Belladonna sulfobenzidine
133	Sulfonamides	Compound sulfamethoxazole
134	Sulfonamides	Crystal sulfonamide
135	Sulfonamides	Sodium sulfamethoxazole
136	Teicoplanin	Teicoplanin
137	Tetracyclines	Doxycycline
138	Tetracyclines	Guanidine tetracycline
139	Tetracyclines	Methicycline
140	Tetracyclines	minocycline
141	Tetracyclines	Omycycline
142	Tetracyclines	oxytetracycline
143	Tetracyclines	tetracycline
144	Tetracyclines	Tigecycline
145	Vancomycin & norvancomycin	Norvancomycin
146	Vancomycin & norvancomycin	vancomycin
147	β-lactamase inhibitors	Amoxicillin and Sulbactam
148	β-lactamase inhibitors	Amoxicillin sulbactam pivoxil
149	β-lactamase inhibitors	Ampicillin sulbactam
150	β-lactamase inhibitors	Amtrazumab
151	β-lactamase inhibitors	cefoperazone and sulbactam
152	β-lactamase inhibitors	Cefoperazone tazobactam
153	β-lactamase inhibitors	Cefotaxime sulbactam
154	β-lactamase inhibitors	Ceftazidime Avibactam
155	β-lactamase inhibitors	Ceftazidime tazobactam
156	β-lactamase inhibitors	Ceftriaxone sulbactam
157	β-lactamase inhibitors	Ceftriaxone tazobactam
158	β-lactamase inhibitors	Mezlocillin and Sulbactam
159	β-lactamase inhibitors	Piperacillin and Sulbactam
160	β-lactamase inhibitors	Piperacillin tazobactam
161	β-lactamase inhibitors	Shubactam

Supplementary Table S2. Drug-resistant proportions of CRO and VRE at the provincial level in China from 2016 to 2022

Bacteria	Year	Drug-resistance proportions (%)			β	z	p
		Median	P_{25}	P_{75}			
CREC	2016	1.3	0.8	2.1	0.001	0.100	0.917
	2017	1.2	0.9	1.9			
	2018	1.2	0.9	2.1			
	2019	1.5	1.0	2.2			
	2020	1.6	0.9	1.8			
	2021	1.4	0.9	2.1			
	2022	1.4	1.0	1.9			
CRKP	2016	4.6	2.5	11.7	0.061	4.442	< 0.001
	2017	5.5	2.2	10.7			
	2018	5.8	3.5	11.9			
	2019	7.1	3.8	12.4			
	2020	7.9	3.9	12.7			
	2021	8.9	3.2	13.4			
	2022	8.2	3.4	11.4			
CRAB	2016	59.1	52.7	64.6	-0.042	-3.605	< 0.001
	2017	54.2	50.6	60.5			
	2018	54.9	49.0	60.1			
	2019	55.1	45.9	60.4			
	2020	52.9	45.2	59.0			
	2021	52.7	47.0	58.0			
	2022	52.6	45.8	58.0			
CRPA	2016	18.8	15.8	26.2	-0.051	-8.068	< 0.001
	2017	17.4	14.2	25.1			
	2018	16.9	13.0	24.1			
	2019	16.3	12.6	24.8			
	2020	15.6	12.6	21.5			
	2021	15.4	11.9	20.3			
	2022	14.5	11.6	20.6			
VR E. faecium	2016	1.4	0.8	1.9	-0.126	-3.830	< 0.001
	2017	1.0	0.5	1.2			
	2018	0.9	0.5	1.5			
	2019	0.4	0.2	0.9			
	2020	0.3	0.2	0.8			
	2021	0.4	0.2	1.1			
	2022	0.5	0.3	1.4			
VR E. faecalis	2016	0.5	0.4	0.7	-0.145	-5.930	< 0.001
	2017	0.4	0.2	0.6			
	2018	0.3	0.1	0.4			
	2019	0.2	0.1	0.3			
	2020	0.2	0.1	0.3			
	2021	0.2	0.1	0.4			
	2022	0.2	0.1	0.3			

Supplementary Table S3. DDDs of antibiotics at the provincial level in China from 2016 to 2022

Antibiotic	Year	DDDs					*β*	*t*	*P*
		Sum	Mean	Median	P_{25}	P_{75}			
Aminoglycosides ($\times10^5$)	2016	48.64	1.57	0.91	0.49	2.28	-801.5	-0.299	0.767
	2017	50.41	1.63	0.94	0.38	3.09			
	2018	52.26	1.69	1.05	0.40	2.83			
	2019	52.37	1.69	1.22	0.43	2.97			
	2020	39.82	1.28	0.93	0.33	2.06			
	2021	42.63	1.38	0.96	0.29	2.68			
	2022	55.66	1.80	1.19	0.42	2.72			
Amphenicols ($\times10^2$)	2016	1,322.06	44.07	5.82	0.96	52.00	-767.23	-2.471	0.019
	2017	1,311.74	43.72	3.93	0.58	27.90			
	2018	843.36	28.11	2.46	0.20	16.50			
	2019	399.11	13.30	2.57	0.07	18.50			
	2020	112.44	3.75	0.06	0.00	6.00			
	2021	180.08	6.00	0.02	0.00	3.69			
	2022	155.48	9.15	5.34	2.48	13.77			
β-lactamase inhibitors($\times10^5$)	2016	349.94	11.29	6.52	4.01	18.17	61,318	3.408	0.002
	2017	364.16	11.75	7.50	4.00	17.73			
	2018	381.50	12.31	7.57	4.27	18.17			
	2019	423.26	13.65	7.96	4.74	19.80			
	2020	331.85	10.70	6.52	4.29	17.23			
	2021	360.10	11.62	7.74	4.25	17.37			
	2022	546.62	17.63	13.21	7.61	27.06			
Carbapenems ($\times10^5$)	2016	94.43	3.05	2.42	0.78	4.80	23,831	5.19	< 0.001
	2017	103.24	3.33	2.61	0.87	5.24			
	2018	109.25	3.52	2.84	0.91	5.56			
	2019	112.81	3.64	3.44	0.92	5.68			
	2020	103.01	3.32	3.06	0.95	5.08			
	2021	114.17	3.68	3.70	0.86	5.60			
	2022	158.17	5.10	3.63	2.29	7.46			
Cephalosporins ($\times10^5$)	2016	1,768.65	57.05	36.82	15.50	87.03	85,235	1.587	0.123
	2017	1,750.55	56.47	36.74	14.77	83.79			
	2018	1,750.95	56.48	34.70	13.82	85.35			
	2019	1,858.07	59.94	37.43	14.48	92.19			
	2020	1,349.72	43.54	28.14	11.42	65.36			
	2021	1,577.35	50.88	32.93	11.75	73.81			
	2022	2,264.47	73.05	44.48	26.89	107.03			
Vancomycin & norvancomycin ($\times10^5$)	2016	12.89	0.42	0.27	0.10	0.61	4,852.9	6.216	< 0.001
	2017	13.75	0.44	0.31	0.10	0.67			
	2018	14.58	0.47	0.36	0.09	0.63			
	2019	15.56	0.50	0.45	0.13	0.64			
	2020	15.23	0.49	0.40	0.14	0.69			

Antibiotic	Year	DDDs					*β*	*t*	*P*
		Sum	Mean	Median	P_{25}	P_{75}			
	2021	17.49	0.56	0.49	0.14	0.81			
	2022	24.22	0.78	0.64	0.34	1.10			
Teicoplanin ($\times10^5$)	2016	5.99	0.19	0.12	0.03	0.30	-395.25	-1.625	0.114
	2017	6.34	0.20	0.09	0.02	0.39			
	2018	6.53	0.21	0.09	0.02	0.39			
	2019	6.35	0.20	0.09	0.02	0.36			
	2020	5.59	0.18	0.09	0.01	0.29			
	2021	4.87	0.16	0.09	0.01	0.23			
	2022	6.12	0.21	0.10	0.02	0.31			
Lincomycin Clindamycin($\times10^5$)	2016	57.53	1.86	0.87	0.37	1.81	26,735.33	3.563	0.001
	2017	62.15	2.00	0.83	0.34	2.11			
	2018	74.21	2.39	0.88	0.35	2.05			
	2019	85.00	2.74	1.06	0.37	2.39			
	2020	58.11	1.87	0.84	0.28	1.98			
	2021	87.46	2.82	1.27	0.43	2.93			
	2022	123.38	3.98	2.26	0.85	5.03			
Macrolides ($\times10^5$)	2016	1,254.55	40.47	26.71	11.43	58.79	29,109	0.667	0.510
	2017	1,243.70	40.12	27.17	12.35	60.19			
	2018	1,263.36	40.75	26.59	10.75	58.01			
	2019	1,404.88	45.32	27.57	11.20	68.87			
	2020	929.66	29.99	22.81	7.22	45.86			
	2021	1,073.94	34.64	25.99	9.43	53.39			
	2022	1,563.18	50.43	32.96	16.13	72.11			
Oxazolidinones ($\times10^5$)	2016	4.98	0.17	0.09	0.03	0.21	10,592.98	6.240	< 0.001
	2017	6.88	0.23	0.14	0.05	0.35			
	2018	9.26	0.31	0.20	0.06	0.51			
	2019	12.15	0.41	0.24	0.09	0.72			
	2020	12.01	0.40	0.24	0.14	0.74			
	2021	17.72	0.59	0.40	0.21	0.99			
	2022	27.41	0.88	0.67	0.41	1.19			
Penicillin ($\times10^5$)	2016	550.87	17.77	11.90	4.26	27.85	390,900	5.934	< 0.001
	2017	572.36	18.46	12.89	3.94	29.07			
	2018	634.30	20.46	15.26	3.83	32.17			
	2019	741.07	23.91	17.86	4.24	37.45			
	2020	611.64	19.73	15.77	4.06	30.97			
	2021	871.34	28.11	19.36	5.57	44.10			
	2022	1,490.21	48.07	29.40	14.72	76.42			
Polymyxin ($\times10^2$)	2016	0.00	0.00	-	-	-	2,244.77	5.463	< 0.001
	2017	2.43	0.09	0	0	0			
	2018	275.52	9.84	3.95	0.74	10.78			
	2019	927.57	33.13	12.72	3.35	47.47			

Antibiotic	Year	DDDs					*β*	*t*	*P*
		Sum	Mean	Median	P_{25}	P_{75}			
	2020	1,541.38	55.05	21.69	5.09	76.94			
	2021	2,489.54	88.91	38.66	13.41	152.62			
	2022	4,176.32	139.21	63.75	27.12	248.89			
Quinolones ($\times 10^5$)	2016	632.92	20.42	10.76	5.84	31.56	256,600	4.923	< 0.001
	2017	649.43	20.95	11.13	6.02	32.55			
	2018	703.38	22.69	12.03	6.58	35.20			
	2019	806.53	26.02	12.66	7.04	40.77			
	2020	654.37	21.11	11.16	6.03	36.13			
	2021	817.27	26.36	13.43	6.61	43.54			
	2022	1,279.67	41.28	23.79	14.15	62.24			
Sulfonamides ($\times 10^5$)	2016	16.68	0.56	0.21	0.03	0.63	15,574.66	4.422	< 0.001
	2017	20.18	0.67	0.32	0.03	0.82			
	2018	18.73	0.62	0.16	0.01	0.53			
	2019	22.09	0.74	0.28	0.05	0.84			
	2020	21.18	0.71	0.37	0.05	1.09			
	2021	30.73	1.02	0.51	0.10	1.49			
	2022	52.97	1.89	1.25	0.38	2.65			
Tetracyclines ($\times 10^5$)	2016	189.54	6.32	2.44	0.54	7.86	209,200	3.613	0.001
	2017	207.77	6.93	2.41	0.61	9.12			
	2018	248.47	8.28	2.62	0.64	10.80			
	2019	320.68	10.69	4.02	1.06	14.60			
	2020	326.35	10.88	4.41	1.28	12.80			
	2021	465.74	15.52	6.24	1.70	21.60			
	2022	595.12	19.20	7.94	3.59	23.84			