

Supplementary Table S1. Distribution of Participating Hospitals Reporting ESBL Results for different AST systems

AST ^a System	Participating Hospitals ^b		Reported ESBL Results ^c		Reported Correct ESBL Results ^d	
	No.	%	No.	%	No.	%
DL	130	15.30%	122	93.80%	118	96.70%
Microscan	133	15.60%	127	95.50%	126	99.20%
Phoenix	146	17.20%	122	83.60%	113	92.60%
TDR	50	5.90%	9	18.00%	6	66.70%
Vitek 2	392	46.10%	296	75.50%	295	99.70%
Total	851	100.00%	676	79.40%	658	97.30%

^aAST, Automated antibiotic susceptibility test system.

^bNumber (%) of hospitals using a particular automated AST system.

^cNumber (%) of hospitals reporting ESBL results for each automated AST system.

^dNumber (%) of hospitals which reported correct ESBL results for each automated AST system.

Supplementary Table S2. Antimicrobial Susceptibility Results of 3 Quality Control Strains Reported by Five Automated Systems in 780 Hospitals.

System	Reported QC ^a		Failed QC ^c	
	No.	% ^b	No.	% ^d
DL	228	14.40%	22	9.60%
Microscan	253	16.00%	33	13.00%
Phoenix	273	17.30%	28	10.30%
TDR	69	4.40%	6	8.70%
Vitek 2	758	47.90%	76	10.00%
Total	1581	100.00%	165	10.40%

^aNumber of total susceptibility results of 3 quality control strains reported by the 5 automated systems.

^bPercentage of the total number of susceptibility results by the 5 automated systems.

^cNumber of results outside the expected MIC range for the 3 quality control strains by the 5 automated systems as per the CLSI 2017 breakpoints.

^dPercentage of the number of susceptibility results outside the expected MIC range by the 5 automated systems as per the CLSI 2017 breakpoints.

Supplementary Table S3. Susceptibility Results of Quality Control Strains for each Antibiotic Reported by Five Automated Systems in Total as Interpreted by CLSI 2017.

Abx	Total ^a	MIC outside Reference Range ^b		Susceptibility Category Not Determinable ^c		MIC within Reference Range ^d	
		No.	%	No.	%	No.	%
SXT	1431	52	3.6%	741	51.8%	638	44.6%
FEP	1431	51	3.6%	1250	87.4%	130	9.1%
LVX	1431	48	3.4%	1001	70.0%	382	26.7%
CIP	1431	46	3.2%	1270	88.7%	115	8.0%
CAZ	1431	38	2.7%	1032	72.1%	361	25.2%
AMK	1431	34	2.4%	1333	93.2%	64	4.5%
ATM	1581	35	2.2%	913	57.7%	633	40.0%
MEM	1431	30	2.1%	960	67.1%	441	30.8%
TZP	1581	32	2.0%	1440	91.1%	109	6.9%
CRO	1431	28	2.0%	686	47.9%	717	50.1%
GEN	1431	27	1.9%	1361	95.1%	43	3.0%
IPM	1431	26	1.8%	859	60.0%	546	38.2%
PIP	1581	23	1.5%	664	42.0%	894	56.5%
TOB	1431	18	1.3%	951	66.5%	462	32.3%
AMP	928	11	1.2%	528	56.9%	389	41.9%
CXM	778	8	1.0%	247	31.7%	523	67.2%
CZO	778	8	1.0%	703	90.4%	67	8.6%
ETP	1431	14	1.0%	474	33.1%	943	65.9%
CTT	778	7	0.9%	277	35.6%	494	63.5%
NIT	778	7	0.9%	403	51.8%	368	47.3%
SAM	928	7	0.8%	386	41.6%	535	57.7%
AMC	928	2	0.2%	182	19.6%	744	80.2%

Abx: antibiotic, AMP: ampicillin, PIP: piperacillin, AMC: amoxicillin/clavulanic acid, SAM: ampicillin/sulbactam, TZP: piperacillin/tazobactam, CZO: cefazolin, CXM: cefuroxime, CAZ: ceftazidime, CRO: ceftriaxone, FEP: cefepime, CTT: cefotetan, ATM: aztreonam, ETP: ertapenem, IPM: imipenem, MEM: meropenem, AMK: amikacin, GEN: gentamicin, TOB: tobramycin, CIP: ciprofloxacin, LVX: levofloxacin, SXT: trimethoprim/sulfamethoxazole, NIT: nitrofurantoin.

^aTotal number of individual susceptibility results of 3 ATCC strains reported by 5 automated systems.

^bMIC outside reference range (failed QC).

^cSusceptibility category not determinable when interpreted using CLSI 2017 document.

^dMIC within reference range (passed QC).

Supplementary Table S4. Susceptibility Results of Quality Control Strains for Each Antibiotic Reported by DL System as Interpreted by CLSI 2017.

Abx	Total ^a	MIC outside Reference Range ^b		Susceptibility Category Not Determinable ^c		MIC within Reference Range ^d	
		No.	%	No.	%	No.	%
FEP	221	8	3.6%	193	87.3%	20	9.0%
LVX	221	7	3.2%	160	72.4%	54	24.4%
CIP	221	6	2.7%	195	88.2%	20	9.0%
SXT	221	5	2.3%	127	57.5%	89	40.3%
ATM	228	5	2.2%	137	60.1%	86	37.7%
CRO	221	4	1.8%	111	50.2%	106	48.0%
IPM	221	4	1.8%	132	59.7%	85	38.5%
CAZ	221	4	1.8%	157	71.0%	60	27.1%
AMK	221	3	1.4%	209	94.6%	9	4.1%
PIP	228	2	0.9%	110	48.2%	116	50.9%
TZP	228	2	0.9%	212	93.0%	14	6.1%
CXM	119	1	0.8%	43	36.1%	75	63.0%
SAM	126	1	0.8%	56	44.4%	69	54.8%
MEM	221	1	0.5%	160	72.4%	60	27.1%
GEN	221	1	0.5%	215	97.3%	5	2.3%
AMC	126	0	0.0%	25	19.8%	101	80.2%
AMP	126	0	0.0%	69	54.8%	57	45.2%
NIT	119	0	0.0%	67	56.3%	52	43.7%
CZO	119	0	0.0%	113	95.0%	6	5.0%

Abx: antibiotic, AMP: ampicillin, PIP: piperacillin, AMC: amoxicillin/clavulanic acid, SAM: ampicillin/sulbactam, TZP: piperacillin/tazobactam, CZO: cefazolin, CXM: cefuroxime, CAZ: ceftazidime, CRO: ceftriaxone, FEP: cefepime, CTT: cefotetan, ATM: aztreonam, ETP: ertapenem, IPM: imipenem, MEM: meropenem, AMK: amikacin, GEN: gentamicin, TOB: tobramycin, CIP: ciprofloxacin, LVX: levofloxacin, SXT: trimethoprim/sulfamethoxazole, NIT: nitrofurantoin

^aTotal number of individual susceptibility results of 3 ATCC strains reported by DL system.

^bMIC outside reference range (failed QC).

^cSusceptibility category not determinable when interpreted using CLSI 2017 document.

^dMIC within reference range (passed QC).

Supplementary Table S5. Susceptibility Results of Quality Control Strains for Each Antibiotic Reported by Vitek 2 as Interpreted by CLSI 2017.

Abx	Total ^a	MIC outside Reference Range ^b		Susceptibility Category Not Determinable ^c		MIC within Reference Range ^d	
		No.	%	No.	%	No.	%
SXT	637	25	3.9%	311	48.8%	301	47.3%
LVX	637	24	3.8%	434	68.1%	179	28.1%
FEP	637	23	3.6%	549	86.2%	65	10.2%
CIP	637	23	3.6%	565	88.7%	49	7.7%
AMK	637	20	3.1%	588	92.3%	29	4.6%
CAZ	637	18	2.8%	458	71.9%	161	25.3%
MEM	637	16	2.5%	403	63.3%	218	34.2%
GEN	637	16	2.5%	602	94.5%	19	3.0%
CRO	637	15	2.4%	293	46.0%	329	51.6%
AMP	473	11	2.3%	276	58.4%	186	39.3%
TZP	758	17	2.2%	684	90.2%	57	7.5%
ATM	758	16	2.1%	413	54.5%	329	43.4%
IPM	637	12	1.9%	383	60.1%	242	38.0%
PIP	758	13	1.7%	279	36.8%	466	61.5%
CXM	352	5	1.4%	97	27.6%	250	71.0%
NIT	352	5	1.4%	188	53.4%	159	45.2%
CZO	352	5	1.4%	316	89.8%	31	8.8%
TOB	637	9	1.4%	414	65.0%	214	33.6%
SAM	473	6	1.3%	202	42.7%	265	56.0%
ETP	637	5	0.8%	218	34.2%	414	65.0%
AMC	473	2	0.4%	77	16.3%	394	83.3%
CTT	352	1	0.3%	125	35.5%	226	64.2%

Abx: antibiotic, AMP: ampicillin, PIP: piperacillin, AMC: amoxicillin/clavulanic acid, SAM: ampicillin/sulbactam, TZP: piperacillin/tazobactam, CZO: cefazolin, CXM: cefuroxime, CAZ: ceftazidime, CRO: ceftriaxone, FEP: cefepime, CTT: cefotetan, ATM: aztreonam, ETP: ertapenem, IPM: imipenem, MEM: meropenem, AMK: amikacin, GEN: gentamicin, TOB: tobramycin, CIP: ciprofloxacin, LVX: levofloxacin, SXT: trimethoprim/sulfamethoxazole, NIT: nitrofurantoin

^aTotal number of individual susceptibility results of 3 ATCC strains reported by Vitek 2 system.

^bMIC outside reference range (failed QC).

^cSusceptibility category not determinable when interpreted using CLSI 2017 document.

^dMIC within reference range (passed QC).

Supplementary Table S6. Susceptibility Results of Quality Control Strains for Each Antibiotic Reported by TDR System as Interpreted by CLSI 2017.

Abx	Total ^a	MIC outside Reference Range ^b		Susceptibility Category Not Determinable ^c		MIC within Reference Range ^d	
		No.	%	No.	%	No.	%
FEP	68	2	2.9%	61	89.7%	5	7.4%
CZO	41	1	2.4%	36	87.8%	4	9.8%
SXT	68	1	1.5%	42	61.8%	25	36.8%
LVX	68	1	1.5%	49	72.1%	18	26.5%
CIP	68	1	1.5%	64	94.1%	3	4.4%
ATM	69	1	1.4%	45	65.2%	23	33.3%
SAM	42	0	0.0%	14	33.3%	28	66.7%
CXM	41	0	0.0%	16	39.0%	25	61.0%
PIP	69	0	0.0%	36	52.2%	33	47.8%
AMP	42	0	0.0%	23	54.8%	19	45.2%
CRO	68	0	0.0%	39	57.4%	29	42.6%
MEM	68	0	0.0%	47	69.1%	21	30.9%
TOB	68	0	0.0%	48	70.6%	20	29.4%
CAZ	68	0	0.0%	52	76.5%	16	23.5%
TZP	69	0	0.0%	65	94.2%	4	5.8%
AMK	68	0	0.0%	67	98.5%	1	1.5%
GEN	68	0	0.0%	67	98.5%	1	1.5%

Abx: antibiotic, AMP: ampicillin, PIP: piperacillin, AMC: amoxicillin/clavulanic acid, SAM: ampicillin/sulbactam, TZP: piperacillin/tazobactam, CZO: cefazolin, CXM: cefuroxime, CAZ: ceftazidime, CRO: ceftriaxone, FEP: cefepime, CTT: cefotetan, ATM: aztreonam, ETP: ertapenem, IPM: imipenem, MEM: meropenem, AMK: amikacin, GEN: gentamicin, TOB: tobramycin, CIP: ciprofloxacin, LVX: levofloxacin, SXT: trimethoprim/sulfamethoxazole, NIT: nitrofurantoin

^aTotal number of individual susceptibility results of 3 ATCC strains reported by TDR system.

^bMIC outside reference range (failed QC).

^cSusceptibility category not determinable when interpreted using CLSI 2017 document.

^dMIC within reference range (passed QC).

Supplementary Table S7. Susceptibility Results of Quality Control Strains for Each Antibiotic Reported by Microscan System as Interpreted by CLSI 2017.

Abx	Total ^a	MIC outside Reference Range ^b		Susceptibility Category Not Determinable ^c		MIC within Reference Range ^d	
		No.	%	No.	%	No.	%
SXT	244	15	6.1%	129	52.9%	100	41.0%
FEP	244	11	4.5%	209	85.7%	24	9.8%
CIP	244	11	4.5%	209	85.7%	24	9.8%
CAZ	244	10	4.1%	168	68.9%	66	27.0%
LVX	244	10	4.1%	172	70.5%	62	25.4%
MEM	244	9	3.7%	168	68.9%	67	27.5%
AMK	244	8	3.3%	225	92.2%	11	4.5%
ATM	253	8	3.2%	150	59.3%	95	37.5%
TZP	253	8	3.2%	229	90.5%	16	6.3%
IPM	244	7	2.9%	144	59.0%	93	38.1%
GEN	244	7	2.9%	226	92.6%	11	4.5%
CRO	244	6	2.5%	109	44.7%	129	52.9%
TOB	244	6	2.5%	162	66.4%	76	31.1%
PIP	253	5	2.0%	110	43.5%	138	54.5%
CTT	127	2	1.6%	50	39.4%	75	59.1%
NIT	127	2	1.6%	64	50.4%	61	48.0%
ETP	244	3	1.2%	72	29.5%	169	69.3%
AMC	136	0	0.0%	30	22.1%	106	77.9%
CXM	127	0	0.0%	34	26.8%	93	73.2%
SAM	136	0	0.0%	54	39.7%	82	60.3%
AMP	136	0	0.0%	69	50.7%	67	49.3%
CZO	127	0	0.0%	109	85.8%	18	14.2%

Abx: antibiotic, AMP: ampicillin, PIP: piperacillin, AMC: amoxicillin/clavulanic acid, SAM: ampicillin/sulbactam, TZP: piperacillin/tazobactam, CZO: cefazolin, CXM: cefuroxime, CAZ: ceftazidime, CRO: ceftriaxone, FEP: cefepime, CTT: cefotetan, ATM: aztreonam, ETP: ertapenem, IPM: imipenem, MEM: meropenem, AMK: amikacin, GEN: gentamicin, TOB: tobramycin, CIP: ciprofloxacin, LVX: levofloxacin, SXT: trimethoprim/sulfamethoxazole, NIT: nitrofurantoin

^aTotal number of individual susceptibility results of 3 ATCC strains reported by Microscan system.

^bMIC outside reference range (failed QC).

^cSusceptibility category not determinable when interpreted using CLSI 2017 document.

^dMIC within reference range (passed QC).

Supplementary Table S8. Susceptibility Results of Quality Control Strains for Each Antibiotic Reported by Phoenix System as Interpreted by CLSI 2017.

Abx	Total ^a	MIC outside Reference Range ^b		Susceptibility Category Not Determinable ^c		MIC within Reference Range ^d	
		No.	%	No.	%	No.	%
FEP	261	7	2.7%	238	91.2%	16	6.1%
SXT	261	6	2.3%	132	50.6%	123	47.1%
LVX	261	6	2.3%	186	71.3%	69	26.4%
CAZ	261	6	2.3%	197	75.5%	58	22.2%
CIP	261	5	1.9%	237	90.8%	19	7.3%
ATM	273	5	1.8%	168	61.5%	100	36.6%
TZP	273	5	1.8%	250	91.6%	18	6.6%
MEM	261	4	1.5%	182	69.7%	75	28.7%
CZO	139	2	1.4%	129	92.8%	8	5.8%
CRO	261	3	1.1%	134	51.3%	124	47.5%
IPM	261	3	1.1%	157	60.2%	101	38.7%
AMK	261	3	1.1%	244	93.5%	14	5.4%
GEN	261	3	1.1%	251	96.2%	7	2.7%
PIP	273	3	1.1%	129	47.3%	141	51.6%
AMC	151	0	0.0%	37	24.5%	114	75.5%
SAM	151	0	0.0%	60	39.7%	91	60.3%
AMP	151	0	0.0%	91	60.3%	60	39.7%

Abx: antibiotic, AMP: ampicillin, PIP: piperacillin, AMC: amoxicillin/clavulanic acid, SAM: ampicillin/sulbactam, TZP: piperacillin/tazobactam, CZO: cefazolin, CXM: cefuroxime, CAZ: ceftazidime, CRO: ceftriaxone, FEP: cefepime, CTT: cefotetan, ATM: aztreonam, ETP: ertapenem, IPM: imipenem, MEM: meropenem, AMK: amikacin, GEN: gentamicin, TOB: tobramycin, CIP: ciprofloxacin, LVX: levofloxacin, SXT: trimethoprim/sulfamethoxazole, NIT: nitrofurantoin

^aTotal number of individual susceptibility results of 3 ATCC strains reported by Phoenix system.

^bMIC outside reference range (failed QC).

^cSusceptibility category not determinable when interpreted using CLSI 2017 document.

^dMIC within reference range (passed QC).

Supplementary Table S9. Antimicrobial Susceptibilities of two CARSS Strains (S1 and S2) by Broth Microdilution Method Performed at Three Central laboratories.

Antibiotic	Breakpoints		S1		S2	
			MIC	Susceptibility ^a	MIC	Susceptibility ^a
AMP	S<=8	R>=32	>256	R	>256	R
PIP	S<=16	R>=128	>256	R	>256	R
AMC	S<=8	R>=32	8/4	S	>256/128	R
SAM	S<=8	R>=32	16/8	I	>256	R
TZP	S<=16	R>=128	2/4	S	>256/4	R
CZO	S<=16	R>=32	>256	R	>256	R
CXM	S<=8	R>=32	>256	R	>256	R
CAZ	S<=4	R>=16	1	S	16	R
CRO	S<=1	R>=4	>256	R	>256	R
FEP	S<=2	R>=16	2	S	16	R
CTT	S<=16	R>=64	0.25	S	32	I
ATM	S<=4	R>=16	2	S	>256	R
ETP	S<=0.5	R>=2	0.03	S	32	R
IPM	S<=1	R>=4	0.25	S	16	R
MEM	S<=1	R>=4	0.125	S	8	R
AMK	S<=16	R>=64	4	S	>256	R
GEN	S<=4	R>=16	1	S	>256	R
TOB	S<=4	R>=16	1	S	>256	R
CIP	S<=1	R>=4	8	R	16	R
LVX	S<=2	R>=8	8	R	16	R
SXT	S<=2	R>=4	>256	R	>256	R
NIT	S<=32	R>=128	16	S	>256	R

AMP: ampicillin, PIP: piperacillin, AMC: amoxicillin/clavulanic acid, SAM: ampicillin/sulbactam, TZP: piperacillin/tazobactam, CZO: cefazolin, CXM: cefuroxime, CAZ: ceftazidime, CRO: ceftriaxone, FEP: cefepime, CTT: cefotetan, ATM: aztreonam, ETP: ertapenem, IPM: imipenem, MEM: meropenem, AMK: amikacin, GEN: gentamicin, TOB: tobramycin, CIP: ciprofloxacin, LVX: levofloxacin, SXT: trimethoprim/sulfamethoxazole, NIT: nitrofurantoin

Susceptibility^a: Susceptibility category