

In-vitro susceptibility of *Neisseria gonorrhoeae* to netilmicin and etimicin in comparison to gentamicin and other aminoglycosides

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Supplementary Information

Table S1 List of bacterial reference strains used in this study

Species	Strain	Agar Dilution, MIC ($\mu\text{g/mL}$), geometric mean													
		GEN	C1	C1a	C2b	ETM	SIS	NET	APR	CTR	AZI	CTZ	SOL	ZOL	
<i>N. gonorrhoeae</i>	ATCC 49226	5.1	4.0	4.5	6.3	4.5	5.0	4.0	16	0.016	0.42	0.125	0.25	0.25	
<i>N. gonorrhoeae</i>	ATCC 19424	3.6	4.0	4.5	6.3	2.8	nd	nd	nd	nd	nd	nd	nd	nd	
<i>N. gonorrhoeae</i>	ATCC 43069	1.8	1.6	1.8	2.8	1.6	nd	nd	nd	nd	nd	nd	nd	nd	
<i>N. meningitidis</i>	ATCC 13077	1.8	1.1	1.4	2.2	1.4	nd	nd	nd	nd	nd	nd	nd	nd	
CLSI QC range <i>N. gonorrhoeae</i>		4-16	-	-	-	-	-	-	-	0.004-0.016	0.25-1	-	0.03-0.25	0.06-0.5	
CLSI Breakpoint <i>N. gonorrhoeae</i>		-	-	-	-	-	-	-	-	≤ 0.025	≤ 1	-	-	-	

Species	Strain	Disk diffusion, inhibition zone diameter (mm), arithmetic mean													
		GEN30	GEN10	C1 10	C1a 10	C2 10	C2a 10	C2b 10	ETM10	SIS10	NET10	TOB10	DIB10	AMK10	APR10
<i>N. gonorrhoeae</i>	ATCC 49226	18.0	13.9	14.7	14.7	14.8	14.5	13.5	15.2	14.3	15.0	12.8	10.8	7.0	8.0
<i>N. gonorrhoeae</i>	ATCC 19424	18.3	14.2	15.0	14.7	14.7	15.0	13.7	15.7	14.3	15.7	12.3	11.0	7.0	9.0
<i>N. gonorrhoeae</i>	ATCC 43069	22.0	17.8	17.7	17.3	18.0	17.5	16.0	19.0	17.0	18.3	15.0	14.3	11.0	12.0
<i>N. meningitidis</i>	ATCC 13077	21.7	18.2	19.3	18.0	19.0	19.0	17.3	20.0	17.3	19.0	15.0	14.0	14.0	13.0

Species	Strain	Etest, MIC ($\mu\text{g/mL}$), geometric mean								
		GEN	CTR	AZI	CIX	CPO	CIP	ERT	PEN	TET
<i>N. gonorrhoeae</i>	ATCC 49226	3.4	≤ 0.016	0.19	≤ 0.016	0.094	0.002	0.006	0.5	1.1
<i>N. gonorrhoeae</i>	ATCC 19424	3.5	≤ 0.016	nd	nd	≤ 0.016	nd	nd	nd	nd
<i>N. gonorrhoeae</i>	ATCC 43069	2.5	≤ 0.016	nd	nd	≤ 0.016	nd	nd	nd	nd
<i>N. meningitidis</i>	ATCC 13077	2.1	≤ 0.016	nd	nd	≤ 0.016	nd	nd	nd	nd

AMK, amikacin; APR, apramycin; AZI, azithromycin; C1, gentamicin C1; C1a, gentamicin C1a; C2, gentamicin C2; C2a, gentamicin C2a; C2b, micromomicin; CIP, ciprofloxacin; CIX, cefixime; CPO, cefpodoxime; CTR, ceftriaxone; CTZ, ceftazidime; DIB, dibekacin; ERT, ertapenem; ETM, etimicin; GEN, gentamicin; NET, netilmicin; PEN, penicillin; SIS, sisomicin; SOL, solithromycin; TET, tetracycline; TOB, tobramycin; ZOL, zoliflodacin.

Table S2 List of bacterial clinical isolates used in this study

Species	Isolate	MIC ($\mu\text{g}/\text{mL}$)							Inhibition zone (mm)		
		Agar Dilution (geometric mean)							Etest	Disk diffusion	
		GEN	ETM	SIS	NET	CTR	AZI	GEN30		TOB10	
<i>N. gonorrhoeae</i>	IMM 2019100109	>8	>8	>8	>8	0.003	0.5	6	nd	nd	
<i>N. gonorrhoeae</i>	IMM 2019102452	2.8	2.8	5.7	2.8	0.008	1.4	4	nd	nd	
<i>N. gonorrhoeae</i>	IMM 2019102504	2.8	2.8	5.7	2.8	0.016	0.25	3	nd	nd	
<i>N. gonorrhoeae</i>	IMM 2019102600	4.0	2.8	4.0	2.8	0.016	>16	4	nd	nd	
<i>N. gonorrhoeae</i>	IMM 2019102604	5.7	2.8	4.0	2.8	0.008	0.25	4	nd	nd	
<i>N. gonorrhoeae</i>	IMM 2019102621	2.8	2.0	2.8	2.0	0.011	0.125	2	nd	nd	
<i>N. gonorrhoeae</i>	IMM 2020100033	2.8	2.8	2.8	2.0	0.5	0.5	3	nd	nd	
<i>N. gonorrhoeae</i>	IMM 2020100103	>8	>8	>8	>8	0.008	0.125	8	nd	nd	
<i>N. gonorrhoeae</i>	IMM 2020830221	2.8	2.8	2.8	2.0	0.008	0.063	3	nd	nd	
<i>N. gonorrhoeae</i>	IMM 2020100137	2.8	2.8	2.8	1.4	0.008	0.063	3	nd	nd	
<i>N. gonorrhoeae</i>	IMM 2020100222	5.7	5.7	5.7	5.7	0.016	0.35	6	nd	nd	
<i>N. gonorrhoeae</i>	IMM 2020100257	2.8	2.8	2.8	2.8	0.008	≤ 0.03	2	nd	nd	
<i>N. gonorrhoeae</i>	IMM 2020100415	5.7	2.8	2.8	2.8	0.008	2.0	4	nd	nd	
<i>N. gonorrhoeae</i>	IMM 2020100548	4.0	2.8	4.0	2.8	0.004	0.5	3	nd	nd	
<i>N. gonorrhoeae</i>	IMM 2020100570	4.0	2.8	4.0	2.8	0.016	0.25	3	nd	nd	
<i>N. gonorrhoeae</i>	IMM 2020100695	2.8	2.8	4.0	2.8	0.004	2.0	4	nd	nd	
<i>N. gonorrhoeae</i>	IMM 2020100916	4.0	2.8	2.8	2.8	0.022	0.25	3	nd	nd	
<i>N. gonorrhoeae</i>	IMM 2020100953	5.7	4.0	4.0	2.8	0.031	0.5	3	nd	nd	
<i>N. gonorrhoeae</i>	IMM 2020101087	5.7	4.0	4.0	4.0	0.008	2.0	4	nd	nd	
<i>N. gonorrhoeae</i>	IMM 2020101116	5.7	4.0	4.0	4.0	0.011	2.0	4	nd	nd	
<i>N. gonorrhoeae</i>	IMM 2020101188	5.7	2.8	2.8	2.8	0.004	0.125	3	nd	nd	
<i>N. gonorrhoeae</i>	IMM 2020101615	4.0	2.8	2.8	2.8	0.011	>16	4	nd	nd	
<i>N. gonorrhoeae</i>	IMM 2020102022	5.7	4.0	4.0	2.8	0.008	2.0	4	nd	nd	
<i>N. gonorrhoeae</i>	IMM 2020102140	4.0	2.8	4.0	2.8	0.008	2.0	4	nd	nd	
<i>N. gonorrhoeae</i>	IMM 2020102312	5.7	4.0	2.8	2.8	0.016	0.25	3	nd	nd	
<i>N. gonorrhoeae</i>	IMM 2020102573	5.7	4.0	2.8	2.8	0.011	0.25	3	nd	nd	
<i>N. gonorrhoeae</i>	IMM 2020102701	5.7	2.8	2.8	2.8	0.011	0.25	2	nd	nd	
<i>N. gonorrhoeae</i>	IMM 2021100328	8.0	5.7	5.7	5.7	0.016	4.0	6	nd	nd	
<i>N. gonorrhoeae</i>	IMM 2021100727	5.7	2.8	4.0	2.8	0.016	0.25	3	nd	nd	
<i>N. gonorrhoeae</i>	IMM 2021101006	2.8	2.8	4.0	1.4	0.008	0.125	3	nd	nd	
<i>N. gonorrhoeae</i>	IMM 2021101089	4.0	2.8	4.0	2.8	0.004	0.25	3	nd	nd	
<i>N. gonorrhoeae</i>	IMM 2021101178	4.0	2.8	4.0	2.8	0.016	0.25	3	nd	nd	
<i>N. gonorrhoeae</i>	IMM 2021101301	4.0	2.8	4.0	2.8	0.003	1.0	3	nd	nd	
<i>N. gonorrhoeae</i>	IMM 2021102029	4.0	2.8	2.8	2.8	0.031	1.0	3	nd	nd	
<i>N. gonorrhoeae</i>	IMM 2015101152	4.0	4.0	4.0	2.8	nd	nd	nd	21	13	
<i>N. gonorrhoeae</i>	IMM 2015101176	5.7	4.0	4.0	4.0	nd	nd	nd	28	22	
<i>N. gonorrhoeae</i>	IMM 2015101189	8.0	8.0	8.0	5.7	nd	nd	nd	20	13	
<i>N. gonorrhoeae</i>	IMM 2015101369	5.7	4.0	5.7	4.0	nd	nd	nd	19	12	
<i>N. gonorrhoeae</i>	IMM 2016100004	8.0	8.0	8.0	5.7	nd	nd	nd	17	12	
<i>N. gonorrhoeae</i>	IMM 2016100103	5.7	4.0	4.0	4.0	nd	nd	nd	21	14	
<i>N. gonorrhoeae</i>	IMM 2016100125	8.0	5.7	5.7	4.0	nd	nd	nd	19	14	
<i>N. gonorrhoeae</i>	IMM 2016100126	5.7	4.0	5.7	4.0	nd	nd	nd	19	13	
<i>N. gonorrhoeae</i>	IMM 2016100134	8.0	5.7	8.0	5.7	nd	nd	nd	21	13	
<i>N. gonorrhoeae</i>	IMM 2016100488	5.7	4.0	4.0	4.0	nd	nd	nd	19	11	
<i>N. gonorrhoeae</i>	IMM 2016100846	5.7	5.7	5.7	4.0	nd	nd	nd	17	13	
<i>N. gonorrhoeae</i>	IMM 2016100994	>8	>8	>8	8.0	nd	nd	nd	19	12	
<i>N. gonorrhoeae</i>	RL GN_24	5.7	4.0	4.0	4.0	nd	nd	nd	nd	nd	
<i>N. gonorrhoeae</i>	RL GN_61	5.7	4.0	4.0	4.0	nd	nd	nd	nd	nd	
<i>N. gonorrhoeae</i>	RL GN_83	8.0	5.7	8.0	5.7	nd	nd	nd	nd	nd	
<i>N. gonorrhoeae</i>	RL GN_95	5.7	4.0	5.7	2.8	nd	nd	nd	nd	nd	
<i>N. gonorrhoeae</i>	RL GN_110	5.7	4.0	4.0	4.0	nd	nd	nd	nd	nd	
<i>N. gonorrhoeae</i>	RL GN_aa181	5.7	4.0	4.0	2.8	nd	nd	nd	nd	nd	
<i>N. gonorrhoeae</i>	RL GN_182	8.0	5.7	5.7	5.7	nd	nd	nd	nd	nd	
<i>N. gonorrhoeae</i>	RL GN_aa183	5.7	5.7	4.0	2.8	nd	nd	nd	nd	nd	
<i>N. gonorrhoeae</i>	RL GN_585	5.7	5.7	5.7	4.0	nd	nd	nd	nd	nd	
<i>N. gonorrhoeae</i>	RL GN_588	5.7	4.0	4.0	2.8	nd	nd	nd	nd	nd	

AZI, azithromycin ($S \leq 1$); CTR, ceftriaxone ($S \leq 0.025$); ETM, etimicin; GEN, gentamicin ($S \leq 16$); GEN30, 30 μg of gentamicin; NET, netilmicin; SIS, sisomicin; TOB10, 10 μg of tobramycin.

Table S2 (continued)

Species	Strain	MIC ($\mu\text{g/mL}$), Agar Dilution								
		GEN	PRP	APR	CTR	AZI	CIX	PEN	TET	CIP
<i>N. gonorrhoeae</i>	CDC01	8	16	32	0.031	0.25	0.125	1	2	8
<i>N. gonorrhoeae</i>	CDC02	8	16	32	0.031	0.5	0.125	1	1	16
<i>N. gonorrhoeae</i>	CDC03	8	16	32	0.031	0.125	0.125	1	1	8
<i>N. gonorrhoeae</i>	CDC04	8	16	32	0.031	0.125	0.125	1	0.5	8
<i>N. gonorrhoeae</i>	CDC05	8	16	32	0.063	0.5	0.125	1	1	8
<i>N. gonorrhoeae</i>	CDC06	8	16	32	0.063	0.5	0.25	1	1	8
<i>N. gonorrhoeae</i>	CDC08	8	16	32	0.016	0.125	0.125	0.25	1	8
<i>N. gonorrhoeae</i>	CDC09	8	16	32	0.031	0.125	0.125	1	1	8
<i>N. gonorrhoeae</i>	CDC10	8	16	64	0.031	0.5	0.125	1	1	16
<i>N. gonorrhoeae</i>	CDC11	8	16	32	0.031	0.25	0.125	1	1	8
<i>N. gonorrhoeae</i>	CDC12	8	16	32	0.031	0.125	0.25	1	1	8
<i>N. gonorrhoeae</i>	CDC13	8	16	32	0.031	0.125	0.063	1	1	8
<i>N. gonorrhoeae</i>	CDC14	8	16	32	0.031	0.125	0.25	1	1	8
<i>N. gonorrhoeae</i>	CDC15	8	16	32	0.008	4	0.031	0.125	0.5	2
<i>N. gonorrhoeae</i>	CDC16	8	16	32	0.063	0.25	4	2	1	8
<i>N. gonorrhoeae</i>	CDC18	8	>16	64	0.063	0.5	0.063	1	1	16
<i>N. gonorrhoeae</i>	CDC19	8	16	32	0.008	8	0.125	0.25	0.5	<0.016
<i>N. gonorrhoeae</i>	CDC20	8	8	16	0.063	>16.0	0.125	0.125	1	2
<i>N. gonorrhoeae</i>	CDC21	8	16	32	0.031	0.125	0.25	1	1	16
<i>N. gonorrhoeae</i>	CDC22	8	16	32	0.008	0.5	0.031	0.25	1	4
<i>N. gonorrhoeae</i>	CDC23	8	>16	64	0.031	0.125	0.125	1	1	8
<i>N. gonorrhoeae</i>	CDC24	8	16	32	0.063	0.25	0.063	1	1	8
<i>N. gonorrhoeae</i>	CDC25	8	16	32	0.031	0.125	0.25	2	1	8
<i>N. gonorrhoeae</i>	CDC26	8	16	32	0.031	0.5	0.063	0.25	0.5	4
<i>N. gonorrhoeae</i>	CDC27	8	16	32	0.031	0.25	0.063	1	1	8
<i>N. gonorrhoeae</i>	CDC28	8	16	32	0.031	0.25	0.25	1	1	16
<i>N. gonorrhoeae</i>	CDC29	8	16	32	0.016	0.5	0.125	1	1	<0.016
<i>N. gonorrhoeae</i>	CDC30	8	16	32	0.031	0.25	0.125	1	1	8
<i>N. gonorrhoeae</i>	CDC31	8	16	32	0.031	0.5	0.25	2	2	8
<i>N. gonorrhoeae</i>	CDC32	8	16	16	0.063	0.125	0.125	1	0.5	8
<i>N. gonorrhoeae</i>	CDC33	8	8	16	0.125	0.125	0.5	1	0.5	2
<i>N. gonorrhoeae</i>	CDC34	8	16	32	0.125	0.125	0.063	1	1	16
<i>N. gonorrhoeae</i>	CDC35	8	16	32	0.125	0.25	0.25	2	2	16
<i>N. gonorrhoeae</i>	CDC36	8	8	32	0.031	4	0.063	0.25	1	8
<i>N. gonorrhoeae</i>	CDC37	8	>16	64	0.031	0.25	0.125	1	1	16
<i>N. gonorrhoeae</i>	CDC38	8	>16	32	0.031	0.25	0.063	1	1	16
<i>N. gonorrhoeae</i>	CDC39	8	16	32	0.031	0.25	0.25	2	1	8
<i>N. gonorrhoeae</i>	CDC40	8	16	32	0.031	0.25	0.125	1	1	8
<i>N. gonorrhoeae</i>	CDC41	8	16	64	0.031	0.25	0.25	2	1	8
<i>N. gonorrhoeae</i>	CDC42	8	16	32	0.031	0.25	0.25	2	2	16
<i>N. gonorrhoeae</i>	CDC43	8	16	32	0.031	0.25	0.25	2	2	16
<i>N. gonorrhoeae</i>	CDC45	8	16	32	0.125	0.5	0.25	2	2	16
<i>N. gonorrhoeae</i>	CDC46	8	16	32	0.031	0.125	0.125	1	1	16
<i>N. gonorrhoeae</i>	CDC47	8	16	32	0.031	0.5	0.125	1	1	16
<i>N. gonorrhoeae</i>	CDC48	8	16	32	0.031	0.25	0.125	1	1	8
<i>N. gonorrhoeae</i>	CDC49	8	16	32	0.031	0.5	0.25	2	1	16
<i>N. gonorrhoeae</i>	CDC50	8	16	32	0.063	0.25	0.25	2	1	16
<i>N. gonorrhoeae</i>	CDC51	8	16	32	0.008	0.125	0.125	2	1	16
<i>N. gonorrhoeae</i>	CDC52	8	16	32	0.008	0.125	0.25	2	1	16
<i>N. gonorrhoeae</i>	CDC53	8	16	64	0.004	0.125	0.25	2	1	16
<i>N. gonorrhoeae</i>	CDC54	8	16	64	0.004	0.016	0.25	2	1	16
<i>N. gonorrhoeae</i>	CDC55	8	16	32	0.031	0.125	0.125	1	1	16
<i>N. gonorrhoeae</i>	CDC56	8	16	32	0.016	0.125	0.25	1	1	16
<i>N. gonorrhoeae</i>	CDC57	8	16	32	0.004	0.125	0.125	1	0.5	<0.016
<i>N. gonorrhoeae</i>	CDC58	8	16	32	0.004	0.125	0.25	2	1	16
<i>N. gonorrhoeae</i>	CDC59	8	16	32	0.004	0.125	0.25	2	16	4
<i>N. gonorrhoeae</i>	CDC60	8	16	32	0.031	0.125	0.125	4	1	16
<i>N. gonorrhoeae</i>	CDC61	8	16	64	0.031	0.25	0.125	4	1	32
<i>N. gonorrhoeae</i>	CDC62	16	16	32	0.008	0.125	0.25	0.25	0.5	0.125
<i>N. gonorrhoeae</i>	CDC63	8	8	32	<0.002	0.016	0.125	<0.008	0.063	<0.016
<i>N. gonorrhoeae</i>	CDC64	8	16	32	0.008	0.125	0.125	0.5	1	<0.016
<i>N. gonorrhoeae</i>	CDC65	8	16	32	0.016	0.125	0.125	0.5	0.5	<0.016
<i>N. gonorrhoeae</i>	CDC66	8	16	32	0.008	4	0.125	0.25	0.5	<0.016
<i>N. gonorrhoeae</i>	CDC67	8	16	64	0.008	0.125	0.125	0.5	1	0.25
<i>N. gonorrhoeae</i>	CDC68	8	16	32	0.016	0.125	0.125	1	1	16
<i>N. gonorrhoeae</i>	CDC69	8	16	32	0.031	0.125	0.063	1	1	16
<i>N. gonorrhoeae</i>	CDC70	8	16	32	0.004	4	0.125	2	1	16
<i>N. gonorrhoeae</i>	CDC71	8	16	32	0.008	0.125	0.016	0.25	1	0.25
<i>N. gonorrhoeae</i>	CDC72	8	16	32	0.031	0.125	0.25	2	1	16
<i>N. gonorrhoeae</i>	CDC73	8	16	32	0.008	0.125	0.125	0.5	1	0.125
<i>N. gonorrhoeae</i>	CDC74	8	16	32	0.008	0.125	0.125	0.25	1	<0.016
<i>N. gonorrhoeae</i>	CDC75	8	16	32	0.016	0.5	0.125	0.5	1	<0.016
<i>N. gonorrhoeae</i>	CDC76	8	16	64	0.016	0.125	0.125	0.5	1	<0.016
<i>N. gonorrhoeae</i>	CDC77	8	8	32	0.008	4	0.125	0.125	1	0.25
<i>N. gonorrhoeae</i>	CDC78	0.5	16	32	0.016	0.031	0.063	0.5	1	2
<i>N. gonorrhoeae</i>	CDC79	8	16	32	0.016	0.125	0.125	1	1	16
<i>N. gonorrhoeae</i>	CDC80	8	16	32	0.008	8	0.125	2	1	0.25
<i>N. gonorrhoeae</i>	CDC81	8	16	32	0.031	0.125	0.25	2	1	16
<i>N. gonorrhoeae</i>	CDC82	8	8	32	0.031	2	0.125	1	0.5	32
<i>N. gonorrhoeae</i>	CDC83	8	16	32	0.008	0.125	0.125	0.25	0.5	0.125
<i>N. gonorrhoeae</i>	CDC84	8	16	32	0.008	0.125	0.125	0.25	0.5	<0.016
<i>N. gonorrhoeae</i>	CDC86	8	8	32	0.008	0.125	0.125	<0.008	0.25	0.25
<i>N. gonorrhoeae</i>	CDC87	8	16	64	0.063	0.125	0.25	2	1	16
<i>N. gonorrhoeae</i>	CDC88	8	16	32	0.031	2	0.125	2	0.5	16
<i>N. gonorrhoeae</i>	CDC89	8	8	32	0.008	2	0.125	1	1	16
<i>N. gonorrhoeae</i>	CDC90	8	16	64	0.031	0.125	0.125	2	1	16
<i>N. gonorrhoeae</i>	CDC91	8	16	32	0.125	0.125	4	2	1	16
<i>N. gonorrhoeae</i>	CDC92	8	16	64	0.031	0.125	0.125	2	1	16
<i>N. gonorrhoeae</i>	CDC93	8	16	64	0.016	0.125	0.125	1	1	16
<i>N. gonorrhoeae</i>	CDC94	8	16	32	0.008	2	0.125	0.25	0.5	<0.016
<i>N. gonorrhoeae</i>	CDC95	8	16	32	0.031	0.125	0.25	2	1	16
<i>N. gonorrhoeae</i>	CDC96	8	16	32	0.016	0.125	0.125	1	0.5	16
<i>N. gonorrhoeae</i>	CDC97	8	16	32	0.031	0.125	0.125	1	1	16
<i>N. gonorrhoeae</i>	CDC98	8	16	32	0.008	2	0.125	0.25	0.5	<0.016
<i>N. gonorrhoeae</i>	CDC99	8	16	32	0.008	4	0.125	0.25	0.5	<0.016
<i>N. gonorrhoeae</i>	CDC100	8	16	32	0.031	0.125	0.25	1	1	16

APR, apramycin; AZI, azithromycin ($S \leq 1$); CIP, ciprofloxacin ($S \leq 0.06$); CIX, cefixime ($S \leq 0.25$); CTR, ceftriaxone ($S \leq 0.025$); GEN, gentamicin ($S \leq 16$); PEN, penicillin ($S \leq 0.06$); PRP, propylamycin; TET, tetracycline ($S \leq 0.25$).

Table S3 Statistical significance (*p* values) of differences observed between the geometric mean MICs using the Mann-Whitney test (black font) and the Student's t-test (blue font).

	Gentamicin MIC = 4.9 µg/mL	Etimicin MIC = 3.7 µg/mL	Sisomicin MIC = 4.2 µg/mL	Netilmicin MIC = 3.2 µg/mL
Gentamicin		2.1e-05	0.00082	1.4e-08
Etimicin	2.1e-05		0.16173	0.04233
Sisomicin	0.0011	0.2539		0.00075
Netilmicin	1.7e-09	0.0385	0.0013	

Table S4 Frequency of *N. gonorrhoeae* aminoglycoside resistance

		<i>Neissera gonorrhoeae</i>		
		ATCC 49226	ATCC 19424	ATCC 43069
Gentamicin	8 µg/mL	4.3×10^{-7}	1.1×10^{-7}	$< 3.7 \times 10^{-9}$
Gentamicin	16 µg/mL	$< 7.8 \times 10^{-9}$	$< 6.9 \times 10^{-9}$	$< 3.7 \times 10^{-9}$
Gentamicin	32 µg/mL	$< 7.8 \times 10^{-9}$	$< 6.9 \times 10^{-9}$	$< 3.7 \times 10^{-9}$
Gentamicin C1a	8 µg/mL	3.9×10^{-7}	1.2×10^{-7}	$< 3.7 \times 10^{-9}$
Gentamicin C1a	16 µg/mL	$< 7.8 \times 10^{-9}$	$< 6.9 \times 10^{-9}$	$< 3.7 \times 10^{-9}$
Gentamicin C1a	32 µg/mL	$< 7.8 \times 10^{-9}$	$< 6.9 \times 10^{-9}$	$< 3.7 \times 10^{-9}$
Etimicin	8 µg/mL	$< 7.8 \times 10^{-9}$	$< 6.9 \times 10^{-9}$	$< 3.7 \times 10^{-9}$
Etimicin	16 µg/mL	$< 7.8 \times 10^{-9}$	$< 6.9 \times 10^{-9}$	$< 3.7 \times 10^{-9}$
Etimicin	32 µg/mL	$< 7.8 \times 10^{-9}$	$< 6.9 \times 10^{-9}$	$< 3.7 \times 10^{-9}$

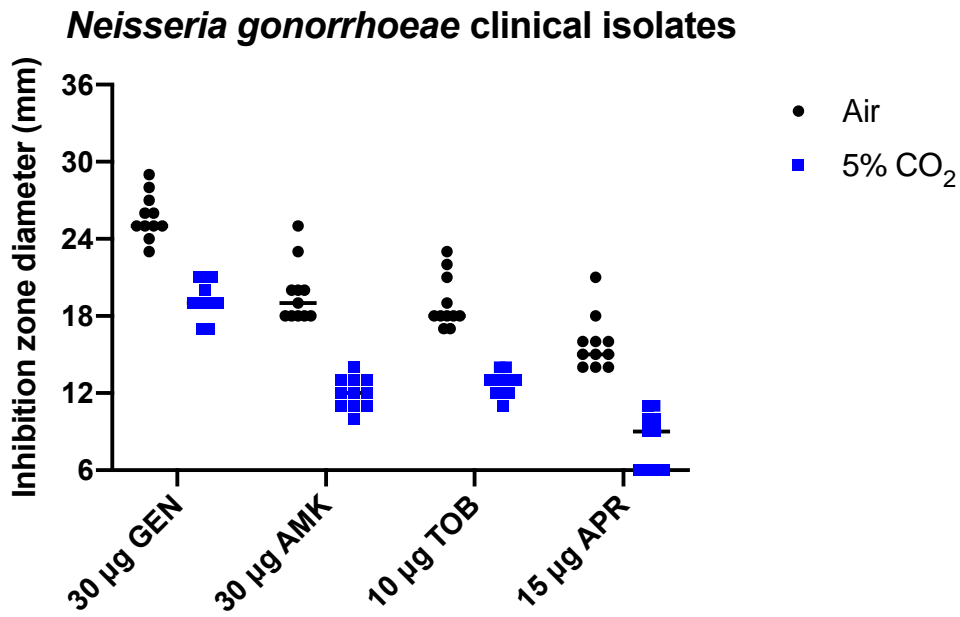


Fig. S1 Effect of atmosphere on the inhibition zone diameter.

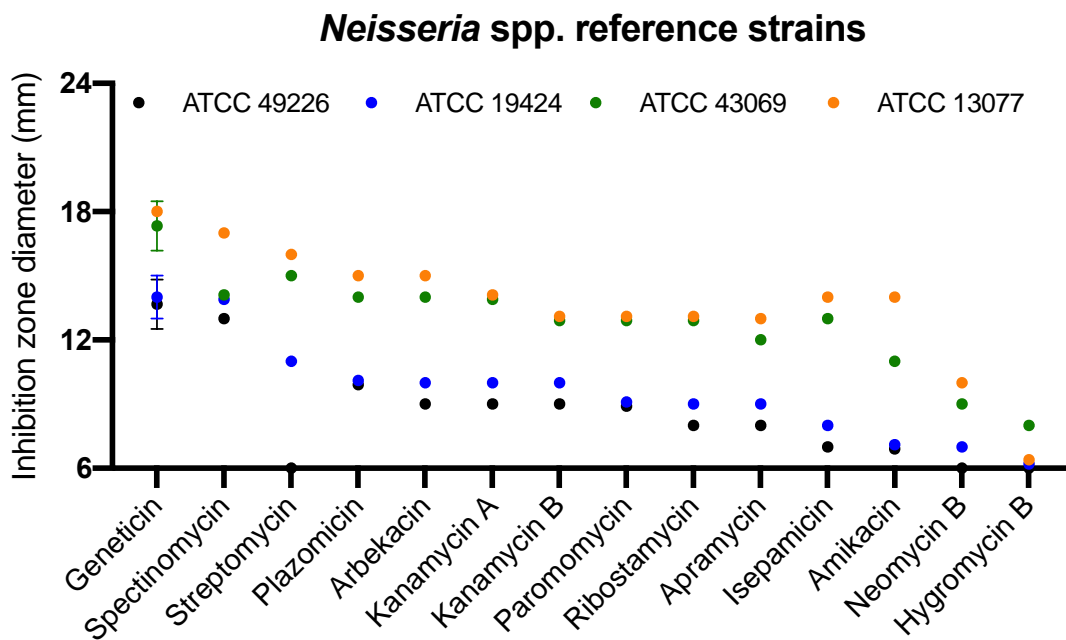
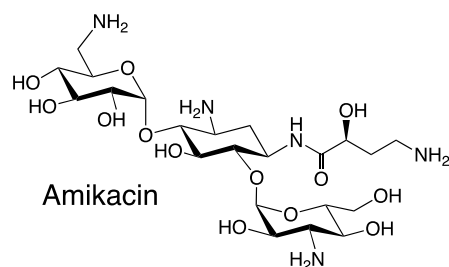
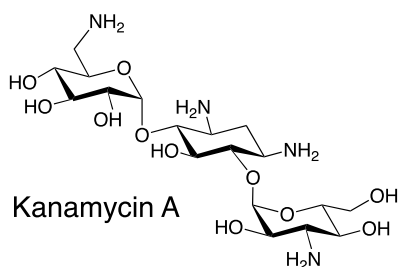
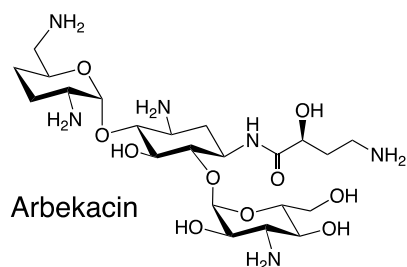
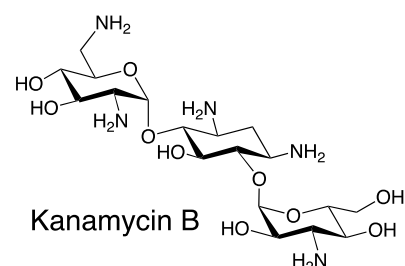
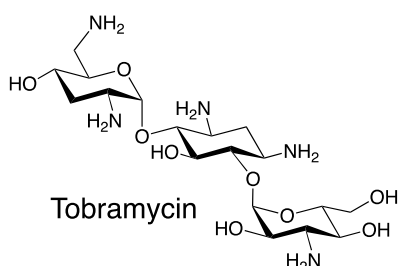
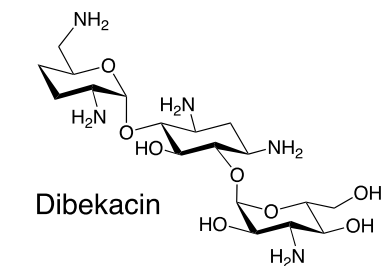
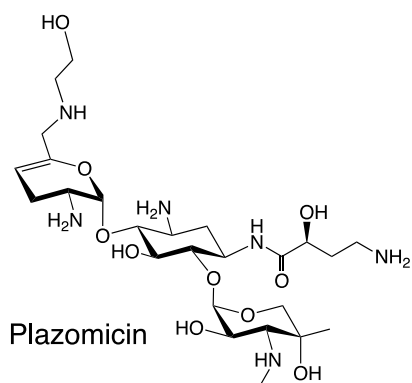
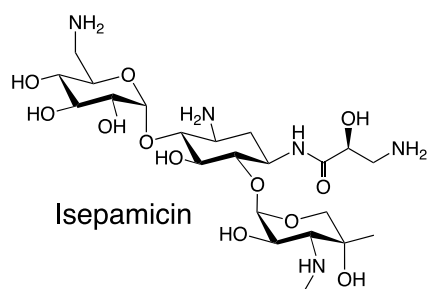


Fig. S2 In-vitro activities of other aminoglycoside antibiotics against *Neisseria* spp.

6-kanosamine-2-deoxystreptamines



6-garosamine-2-deoxystreptamines



5-ribosyl-2-deoxystreptamines

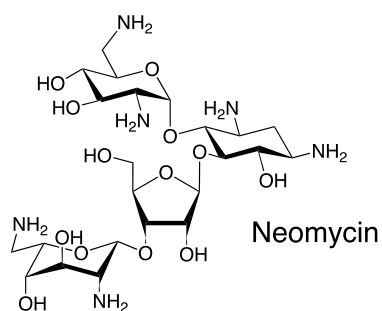
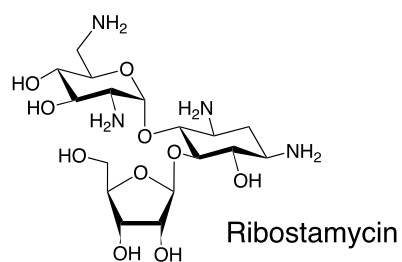


Fig. S3 Chemical structures of additional aminoglycosides discussed in the article.