

Sewer surveillance for monitoring antibiotic use and prevalence of antibiotic resistance: urban sewer epidemiology

Supplemental Material

Table S1. Summary of antibiotics discussed in this paper including example ARG, prescription rates, antibiotic mechanism, and abbreviations used in this paper.

Example ARG ^a	Class	Sub-class	Prescriptions/ 1000ppl ^b	Antibiotic	Cellular target	Abbreviation	
<i>aac, aph</i>	aminoglycoside			amikacin	protein synthesis (30S subunit)	AMK	
				gentamicin		GEN	
				kanamycin		KAN	
				neomycin		NEO	
				streptomycin		STR	
<i>bl2, bl1, pbp, mec</i>	beta-lactam	cephalosporin	114	cefaloridine	cell wall synthesis	CER	
				cefazolin		CFZ	
				cefotaxime		CTX	
				cefoxitin		FOX	
				cefpodoxime		CPD	
				ceftazidime		CAZ	
				ceftriaxone		CRO	
				cefuroxime		CXM	
		penicillin	193	amoxicillin		AMX	
				ampicillin		AMP	
				penicillin G			
				piperacillin-tazobactam		TZP	
						clavulanic acid	
						sulbactam	SUL
<i>bl12, bl1</i>	carbapenem*			imipenem	cell wall synthesis	IPM	
<i>ade, bmr, cat, ceo</i>	chloramphenicol			chloramphenicol*	protein synthesis (50S subunit)	CHL	

Table S1. continued

Example ARG ^a	Class	Sub-class	Prescriptions/1000ppl ^b	Antibiotic	Cellular target	Abbreviation
<i>van</i>	glycopeptide			avoparcin	cell wall synthesis	
				vancomycin*		VAN
<i>bmr, mex, mof, qnr, sme</i>	fluoroquinolone		89	ciprofloxacin	DNA gyrase	CIP
				enoxacin		ENX
				norfloxacin		NOR
				ofloxacin		OFX
				nalidixic acid		NAL
<i>erm</i>	lincosamide		25	clindamycin	protein synthesis (50S subunit)	CLI
<i>erm, mac, msr</i>	macrolide		190	azithromycin	protein synthesis (50S subunit)	AZM
				clarithromycin		CLR
				erythromycin		ERY
				roxithromycin		ROX
<i>nim</i>	nitroimidazoles			metronidazole	nucleic acid synthesis	MTZ
<i>sul</i>	sulfonamide		65	sulfadiazine	nucleic acid (folate) synthesis	SDZ
				sulfamethoxazole		SMX
				sulfamethoxazole/trimethoprim		SXT
				sulphamerazine		SRZ
				trimethoprim		TMP
<i>tet, mex</i>	tetracycline		68	doxycycline	protein synthesis (30S subunit)	DOX
				oxytetracycline		OXY
				tetracycline		TET
	other			nitrofurantoin		NIT
				linezolid		LIN

^aFor a complete ARG list please refer to Comprehensive Antibiotic Resistance Database, ¹

^bData from Hicks et al.²

*Considered drugs of last resort for certain infections

Table S2. Typical physical and chemical characteristics of sewers make these unique environments.

Parameter	Value
Dissolved Oxygen	0-0.3 mg/L (force main) ³ , 0-4 mg/L (gravity sewer) ⁴
Temp	10-30 °C (slower to respond than surface temperatures)
Slope	5% (gravity sewer) ³
TSS	150-450 mg/L
Sediment deposition	30-500 g/m-d ⁵
pH	7-9 ⁶
Hydraulic Residence Time	30 min-12 h ^{4,7,8}
Biosolids Residence Time	Longer than HRT (> 4 days?) ^{9,10}
Lead ^a	20-100 ppb ^{4,11}
Iron ^a	500-1500 ppb ⁴
Cadmium ^a	1-3 ppb ^{4,11}
Zinc ^a	100-300 ppb ^{4,11}
Sulfide ^a	0-5 mg/L ^{4,5}

a. Total dissolved concentration

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