

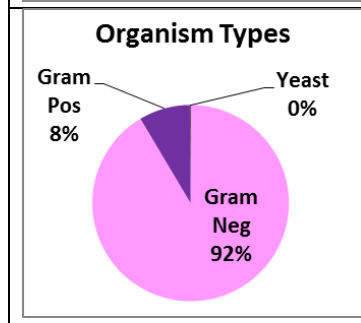
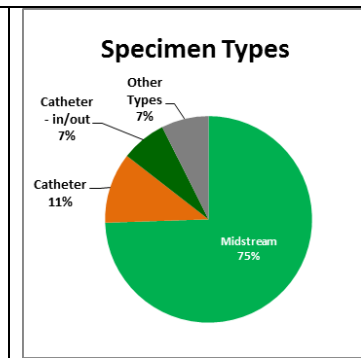
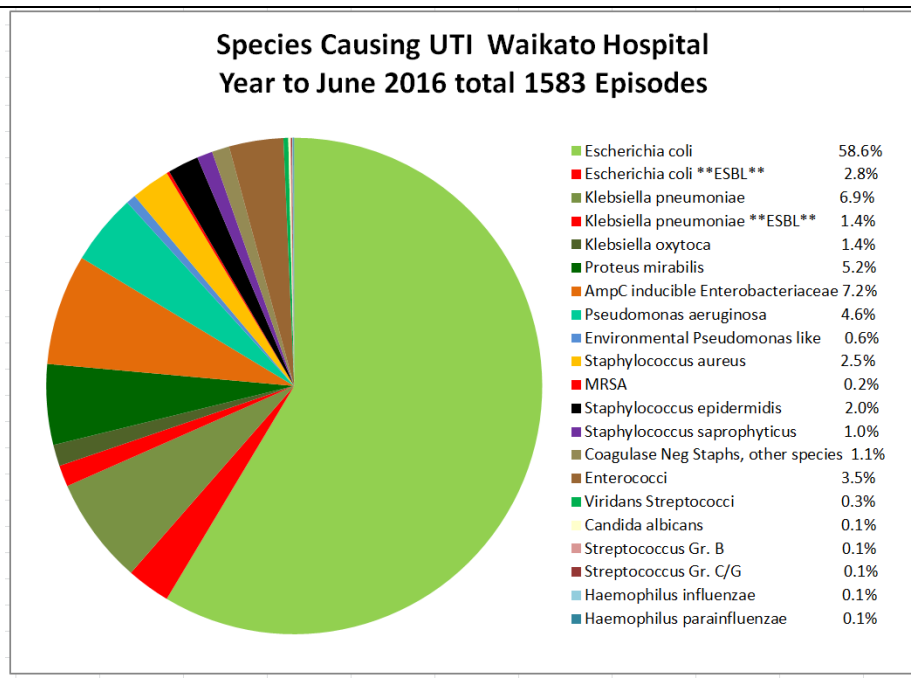
Urinary Tract Infection Antibiotic Susceptibility

Aim
Guidance for selection of empiric antibiotics for UTI.
Surveillance for antibiotic resistance in Waikato populations

Data Set
Urine samples in Waikato Hospital Laboratory Information System
Date range: 1 Jul 2015 to 30 Jun 2016 (12 months)
Selected isolates highly likely to have been the cause of a true UTI
Epithelial cells: nil
WBC > 100 / microlitre
Pure growth with species reported by bench scientist
Duplicate organisms within 30 days excluded
CLSI Vitek 2 and disk methods

Analysis
UTI Episodes
Organisms responsible for UTI
Rates of resistances of interest: ESBL & MRSA
Activity of contender antibiotics for empiric use when organism is unknown.
Susceptibility for organisms of interest (targeted to species)

Limitations
Antibiotics tested vary between species
Some data of interest may not be displayed here.
Suggestions for additional or analysis are welcome.



All Organisms	Contender Antibiotics for Empiric Use														
	Ciprofloxacin	Gentamicin	Meropenem	Nitrofurantoin	Tobramycin	Amikacin	Cefepime	Ceftazidime	Ceftriaxone	Piperacillin-Tazobactam	Cotrimoxazole	Trimethoprim	Amoxicillin-Clavulanate	Cefazolin	
n= 1583															
Percent susceptible among all isolates, including those not tested	87%	84%	78%	75%	74%	73%	68%	68%	67%	66%	62%	62%	60%	52%	
Results for isolates tested against each antibiotic															
Susceptible	91%	95%	100%	80%	94%	100%	92%	92%	91%	91%	77%	72%	72%	70%	
Intermediate	1%			5%	4%					4%			12%		
Resistant	8%	5%		15%	2%		8%	8%	9%	4%	23%	28%	15%	30%	
Number tested	1509	1407	1237	1486	1239	1165	1162	1168	1173	1141	1286	1358	1323	1164	
Percent tested against each antibiotic	95%	89%	78%	94%	78%	74%	73%	74%	74%	72%	81%	86%	84%	74%	

Each organism was only tested against antibiotics considered potentially effective for that species.
No antibiotic offered sure coverage of more than 90% of organisms causing UTI.
Cotrimoxazole, nitrofurantoin and amoxicillin clavulanate had insufficient coverage against gram negatives.
Ciprofloxacin, cotrimoxazole, ceftriaxone and amox-clav had insufficient coverage against the predominant Gram positives, Coagulase negative staphylococci and Enterococci.

Susceptible Enterobacteriaceae species					E. coli, Klebsiella pneumoniae, K. oxytoca and Proteus mirabilis											
n= 1209	Mero-penem	Amikacin	Gentamicin	Tobramycin	Cefepime	Cipro-floxacin	Ceftazidime	Ceftriaxone	Piperacillin-Tazobactam	Nitro-furantoin	Amoxycillin-Clavulanate	Cotri-moxazole	Cefazolin	Tri-methoprim	Amoxycillin	
Susceptible	100%	100%	95%	94%	92.4%	91.6%	91.5%	91.3%	90.9%	82%	77%	76%	75%	73%	38%	
Intermediate				4%		1%			5%	5%	14%					
Resistant			5%	3%	8%	7%	8%	9%	4%	13%	9%	24%	25%	27%	61%	
Number tested	1059	1057	1207	1061	1159	1205	1158	1158	1050	1200	1199	1064	1055	1203	1064	

Enterobacteriaceae (Gram negative bacilli similar to E. coli) caused 84% of UTI.

Ciprofloxacin is replacing norfloxacin. Data presented here incorporates historical norfloxacin test results.

ESBL rates: 4.6% of E. coli and 16.7% of K. pneumoniae.

Piperacillin-tazobactam slightly better than amoxycillin-clavulanate

ESCPM: Enterobacteriaceae with inducible AmpC beta lactamase					Enterobacter, Serratia, Citrobacter, Providencia and Morganella sp.											
n= 106	Amikacin	Meropenem	Cefepime	Gentamicin	Piperacillin-Tazobactam	Cipro-floxacin	Tobramycin	Cotri-moxazole	Tri-methoprim	Ceftazidime	Ceftriaxone	Nitro-furantoin	Amoxycillin-Clavulanate	Cefazolin	Amoxycillin	
Susceptible	100%	99%	98%	97%	96%	96%	95%	91%	91%	87%	86%	38%	21%	20%	1%	
Intermediate	0%	0%	0%	0%	1%	1%	4%	0%	0%	1%	2%	14%	1%	0%	0%	
Resistant	0%	1%	2%	3%	3%	3%	1%	9%	9%	12%	12%	48%	78%	80%	99%	
Number tested	94	94	94	106	76	94	94	94	106	93	92	105	106	94	94	

These species have inducible AmpC beta lactamase, and are initially susceptible but can develop cephalosporin resistance after a few days of treatment.

Phenotypic susceptibility of cephalosporins and penicillins at first isolation is shown here

Cefepime significantly better than ceftriaxone & ceftazidime

Piperacillin-tazobactam much better than amoxycillin-clavulanate

All Enterococci			All Coagulase Negative Staphylococci					Pseudomonas aeruginosa				
n= 56	Nitrofurantoin	Amoxycillin	n= 66	Nitrofurantoin	Norfloxacin	Flucloxacillin	Cotrimoxazole	n= 73	Tobramycin	Meropenem	Gentamicin	Ciprofloxacin
Susceptible	95%	88%	Susceptible	98%	71%	61%	53%	Susceptible	100%	99%	92%	90%
Intermediate			Intermediate		3%		2%	Intermediate		1%	7%	
Resistant		13%	Resistant		26%	39%	45%	Resistant			1%	10%
Number tested	56	56	Number tested	66	66	64	66	Number tested	67	69	73	72

Enterococci were uncommon in this set of rigorously defined UTI. These organisms are intrinsically resistant to most classes of antibiotics.

Enterococcus faecalis			Staphylococcus saprophyticus				
n= 48	Nitrofurantoin	Amoxycillin	n= 16	Nitrofurantoin	Norfloxacin	Flucloxacillin	Cotrimoxazole
Susceptible	100%	100%	Susceptible	100%	100%	100%	88%
Intermediate			Intermediate				6%
Resistant			Resistant				6%
Number tested	48	48	Number tested	16	16	14	16

E. faecalis, was entirely susceptible to both amox and nitrofurantoin. E. faecium (n=7) were all resistant to amoxycillin.

Staphylococcus saprophyticus is a common cause of UTI for young women in the community but quite rare in our hospital based practice. Numbers were small, but our isolates appeared susceptible to commonly prescribed antibiotics..