

ANTIBIOGRAM 2017, WASHOE COUNTY

Organism	# Isolates Identified	Ampicillin (Am)	Amikacin (Ak)	Amoxicillin/clavulanate (Aug)	Amoxicillin/sulbactam (AS)	Cefazolin (Cfz)	Cefepime (Cep)	Ceftriaxone (Cax)	Ceftazidime (Ctz)	Cefuroxime (Cfu)	Cefuroxime (Cfx)	Cefuroxime (Cfm)	Cefuroxime (Cft)	Cefuroxime (Cfz)	Cefuroxime (Ccz)	Cefuroxime (Cca)	Cefuroxime (Ccl)	Cefuroxime (Ccp)	Ertapenem (Ert)	Gentamicin (Gm)	Imipenem (Imp)	Levofloxacin (Lvx)	Meropenem (Mer)	Nitrofurantoin (Fd)	Oxacillin (Ox)	Penicillin-G (P)	Rifampin (Rif)	Quinupristin-dalfopristin (Syn)	Streptomycin 2000 (ST2000)	Tetracycline (Te)	Trimethoprim/sulfamethoxazole (T/S)	Vancomycin (Va)	
<i>Enterococcus faecalis</i>	1157	99%																															
<i>Enterococcus faecium</i>	199	21%																															
<i>Enterococcus species*</i>	1356																																
<i>Staphylococcus aureus</i>	2398	9%		66%	66%			65%	77%	66%	99%	99%	99%	99%	99%	99%	99%	99%	99%	99%	99%	99%	99%	99%	99%	99%	99%	99%	99%	99%	99%	99%	
<i>Staphylococcus spp. Coag neg</i>	437	4%		44%	44%			45%	66%	64%	100%	47%	89%	66%	100%	99%	99%	99%	99%	99%	99%	99%	99%	99%	99%	99%	99%	99%	99%	99%	99%	99%	
<i>Staphylococcus Epidermidis</i>	411	9%		50%	50%			66%	50%	100%	49%	85%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	
<i>Streptococcus pneumoniae**</i>	219																																

* Enterococcus faecalis and Enterococcus faecium ** Data from Washoe County Health District's surveillance project, not based on reported hospital's antibiogram *** Non-meningitis breakpoint: Meningitis breakpoint S% = 75%

Organism	# Isolates Identified	Ampicillin (Am)	Amikacin (Ak)	Amoxicillin/clavulanate (Aug)	Amoxicillin/sulbactam (AS)	Aztreonam (Azi)	Cefepime (Cep)	Cefazolin (Cfz)	Cefuroxime (Cfu)	Cefuroxime (Cfx)	Cefuroxime (Cfm)	Cefuroxime (Cft)	Cefuroxime (Cfz)	Cefuroxime (Ccz)	Cefuroxime (Cca)	Cefuroxime (Ccl)	Cefuroxime (Ccp)	Ertapenem (Ert)	Gentamicin (Gm)	Imipenem (Imp)	Levofloxacin (Lvx)	Meropenem (Mer)	Nitrofurantoin (Fd)	Piperacillin (Pi)	Piperacillin-tazobactam (P/T)	Tetracycline (Te)	Tigecycline (TGC)	Tobramycin (To)	Trimethoprim/sulfamethoxazole (T/S)	
<i>Acinetobacter Baumannii*</i>	40			70%			78%						78%	3%			75%			80%			80%			75%			80%	70%
<i>Citrobacter freundii</i>	40						75%						68%	70%			95%	100%	93%			100%	93%		88%	65%	98%	90%	80%	
<i>Enterobacter aerogenes</i>	126			100%			84%	100%				83%	75%	73%			95%	98%	98%	95%	99%	99%	98%	83%	78%	89%	98%	98%	94%	
<i>Enterobacter cloacae</i>	357			100%			81%	95%				72%	88%	78%			96%	99%	99%	99%	97%	100%	92%	72%	82%	88%	97%	98%	92%	
<i>Escherichia coli</i>	5127	56%	99%	82%	61%	93%	94%	87%	91%	94%	92%	93%	94%	50%	81%	100%	92%	100%	81%	100%	98%	81%	100%	98%	97%	97%	76%	100%	92%	74%
<i>Klebsiella oxytoca</i>	178			94%	69%	92%	96%	45%	82%			96%	90%	90%	97%	100%	96%	100%	99%	94%	100%	94%	100%	94%	92%	99%	99%	96%	90%	88%
<i>Klebsiella pneumoniae</i>	1168			99%	93%	82%	89%	90%	89%	85%	90%	86%	90%	90%	84%	92%	99%	99%	99%	94%	100%	100%	93%	97%	96%	80%	99%	92%	88%	
<i>Morganella morganii**</i>	30			3%	63%	93%							93%	40%	97%	93%	93%								97%					25%
<i>Proteus mirabilis</i>	404	70%	96%	89%	77%	95%	94%	76%	94%	93%			97%	94%	82%	99%	100%	79%			74%	100%		72%	100%			81%	70%	
<i>Pseudomonas aeruginosa</i>	630			97%	91%								90%		86%	91%	89%	85%	94%			74%	100%		72%	100%			81%	70%
<i>Serratia marcescens</i>	53			85%	100%								79%	89%			98%	98%	100%			94%	100%		77%	8%	94%	96%	98%	
<i>Stenotrophomonas maltophilia</i>	36												33%																	97%

* The number of isolates in 2017 was under 30 therefore not reported. Keep the data available from the prior antibiogram for a reference as well as for future report preparation convenience.

SUMMARY OF MAJOR FINDINGS

MRSA

The rate of Methicillin-resistant *Staphylococcus aureus* (MRSA) significantly increased from 35% in 2002 to 48% in 2007, a 37% increase from 2002 to 2007, which showed a statistical significance ($X^2 = 145, P < 0.001$). The MRSA rate was 35% in 2017, which showed no statistically significant decrease compared to 39% in 2016 ($X^2 = 5.334, P = 0.0209$)

VISA / VRSA

Vancomycin-intermediate resistant *Staphylococcus aureus* (VISA) or Vancomycin-resistant *Staphylococcus aureus* (VRSA) has not been found yet in Washoe County. Please report VISA or VRSA to the Washoe County Health District at 775-328-2447. Please also have your laboratory send the VISA/VRSA isolate for further confirmation at the Nevada State Public Health Laboratory.

VRE

The rate of vancomycin-resistant *enterococci* (VRE) increased from 9.8% in 2002 to 11.6% in 2007, which showed a statistical significance ($X^2 = 65, P < 0.001$). The VRE rate was 22.2% in 2017, which did not show any statistically significant change compared to 20.4% in 2016 ($X^2 = 1.255, P = 0.2636$). The VRE rate in 2015 was the highest (25.2%) one since 2002.

DRSP

The rate of drug-resistant *Streptococcus pneumoniae* (DRSP) decreased in the past several years in Washoe County. The rate for penicillin non-susceptible *streptococcus pneumoniae* (PNSSP) decreased from 29% in 2002 to 23% in 2007, a 21% decrease, which did not show a statistical significance ($X^2 = 5.562, P = 0.234$). The decrease might be associated with the introduction of pneumococcal conjugate vaccine in 2000. The rate for PNSSP was significantly reduced to 3% in 2016. The rate for PNSSP in 2017 was 4%, which did not show a statistical significance ($X^2 = 0.3493, P = 0.5545$). The multi-drug resistance (resistant to 2 or more antibiotics tested) rate was 11.4% in 2017, which was similar to 12% in 2016.

ESBLs & CRE

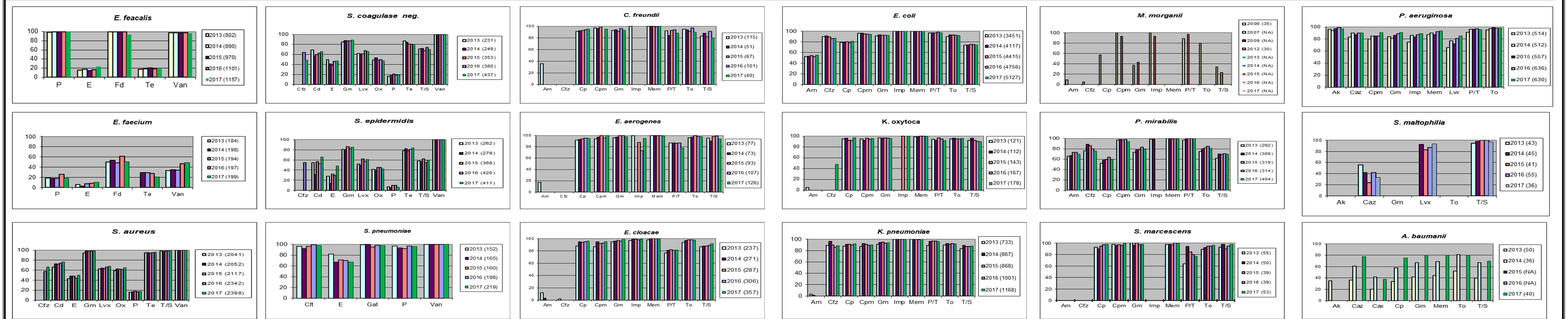
Strains of *Klebsiella spp.*, *E. coli*, *Proteus mirabilis* that produce extended-spectrum beta-lactamase (ESBLs) may be clinically resistant to therapy with penicillins, cephalosporins, or aztreonam, despite apparent *in vitro* susceptibility to some of these agents. ESBL screening data reported from three laboratories showed an average 6.7% of *E. coli/Klebsiella spp./Proteus mirabilis* produced ESBLs in 2017, slightly lower than 7.2% in 2016 but no statistical significance ($X^2 = 1.016, P = 0.3156$). The rate of carbapenem-resistant enterobacteriaceae (CRE) was 0.48% (36/7453) in 2017. It is important to note that the numerator was pulled from the active Carbapenem Resistant Organism (CRO) surveillance beginning 2017.

This antibiogram was compiled by the Division of Epidemiology & Public Health Preparedness (DEPHP), Washoe County Health District in collaboration with all four hospital laboratories in the community. Data covered all inpatients in local hospitals and outpatients seen at hospital emergency rooms. This antibiogram can be used as a reference for clinicians but shouldn't serve as a basis for therapy. The antibiotic susceptibility test for individual patients is still encouraged, if needed. This antibiogram only represents antibiotic susceptibility *in vitro*. Please address your questions, comments, and/or suggestions to DEPHP at 775-328-2447 or e-mail to EpiCenter@WashoeCounty.us. The online version and pocket size version can be downloaded from the Health Department's website at <http://tinyurl.com/WCAntibiogram>.

ACKNOWLEDGEMENTS

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ANTIBIOTIC SUSCEPTIBILITY (%) TREND, 2013-2017, WASHOE COUNTY (Published September 2018)



To read these graphs: Each graph represents an organism; X-axis represents the abbreviation of an antibiotic (see tables above graphs for full name of antibiotics); Y-axis represents susceptibility in percent; legends indicate each year and number of isolates identified for that year in parentheses. **Attention!** The number of *Morganella morganii* was under 30 in 2013-2017. Therefore, the last available data for this organism are displayed here.