WHONET

Resistance Profiles

WHO Collaborating Centre for
Surveillance of Antimicrobial Resistance

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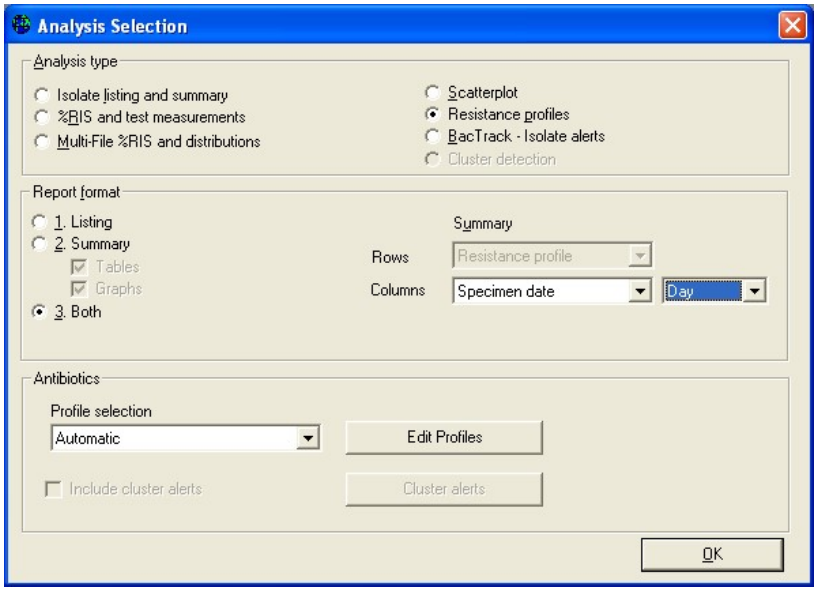
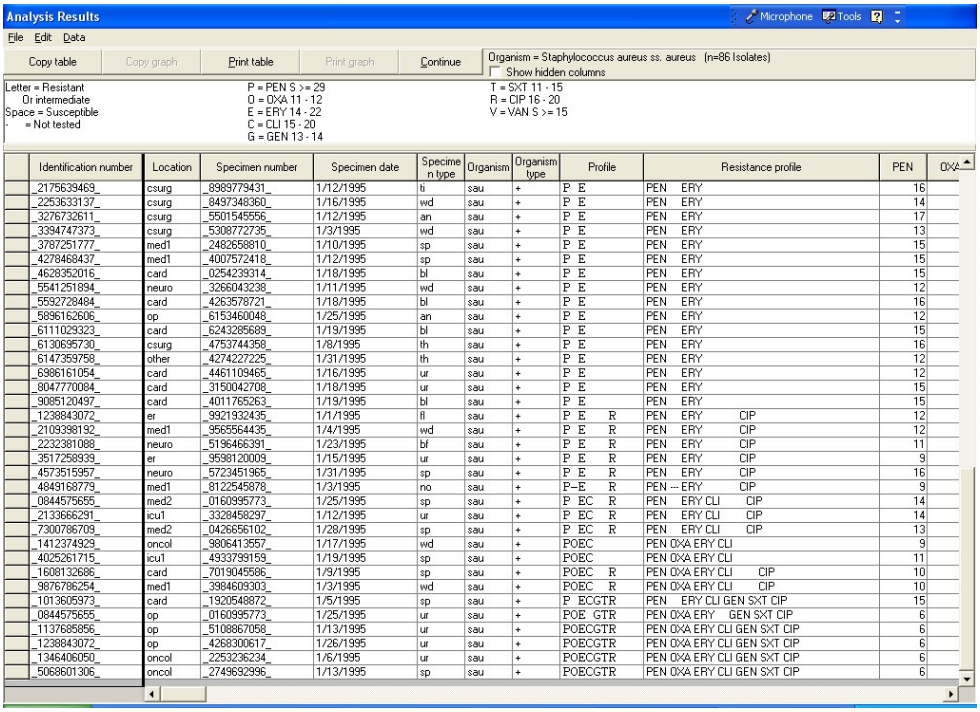
Part 1. Antimicrobial resistance profiles

The final analysis that covered in this tutorial is the study of multi-resistance patterns using the analysis “Resistance profiles”. Click on “Analysis type”, and select “Resistant profiles”. Because you are analyzing only one month of data, change the option “Month” in the middle of the screen to “Day”.



Then “OK” and “Begin analysis”. The following isolate listing shows the bottom portion of the output.

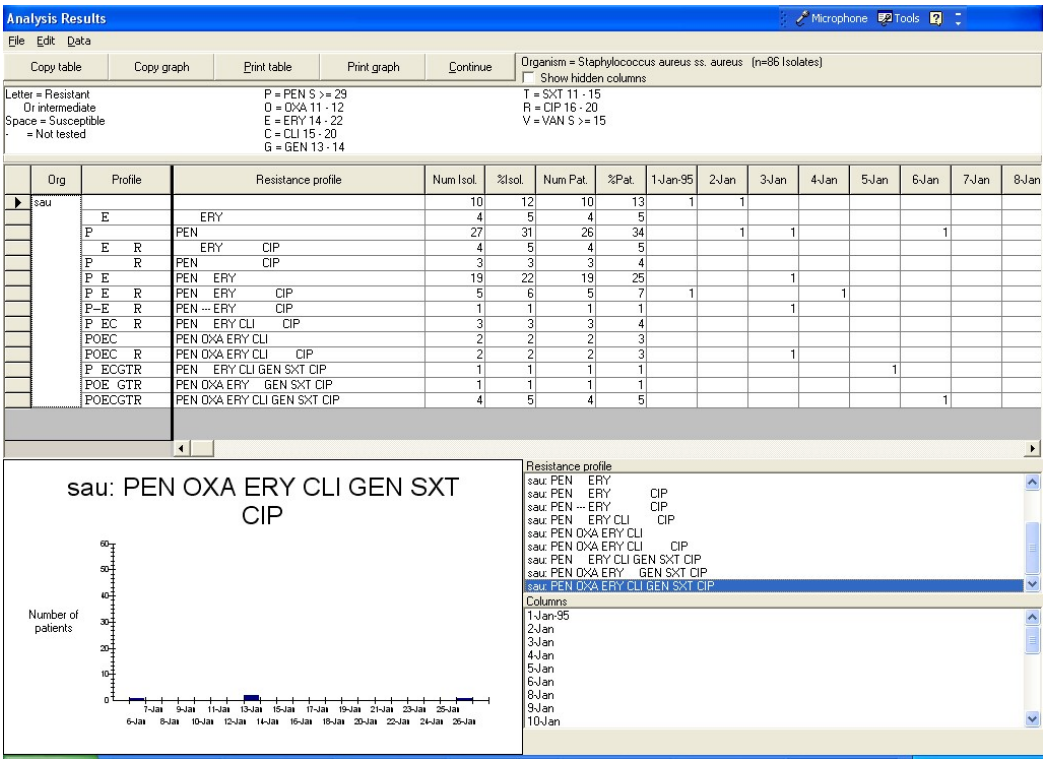


Identification number	Location	Specimen number	Specimen date	Specimen type	Organism	Organism type	Profile	Resistance profile	PEN	OXA
_2175639469_	csurg	_8989779431_	1/12/1995	ti	sau	+	P E	PEN ERY	16	
_2253633137_	csurg	_8497348360_	1/16/1995	wd	sau	+	P E	PEN ERY	14	
_3276732611_	csurg	_5501545556_	1/12/1995	an	sau	+	P E	PEN ERY	17	
_3394747373_	csurg	_5308772735_	1/3/1995	wd	sau	+	P E	PEN ERY	13	
_3787251777_	med1	_2482658810_	1/10/1995	sp	sau	+	P E	PEN ERY	15	
_4278468437_	med1	_4007572418_	1/12/1995	sp	sau	+	P E	PEN ERY	15	
_4628352016_	card	_0254239314_	1/18/1995	bl	sau	+	P E	PEN ERY	15	
_5541251894_	neuro	_3266043236_	1/11/1995	wd	sau	+	P E	PEN ERY	12	
_5592728484_	card	_4263578721_	1/18/1995	bl	sau	+	P E	PEN ERY	16	
_5896162606_	op	_6153460048_	1/25/1995	an	sau	+	P E	PEN ERY	12	
_6111029323_	card	_6243285689_	1/19/1995	bl	sau	+	P E	PEN ERY	15	
_6130695730_	csurg	_4753744358_	1/8/1995	th	sau	+	P E	PEN ERY	16	
_6147359758_	other	_4274227225_	1/31/1995	th	sau	+	P E	PEN ERY	12	
_6986161054_	card	_4461109465_	1/16/1995	ur	sau	+	P E	PEN ERY	12	
_8047770084_	card	_3150042708_	1/18/1995	ur	sau	+	P E	PEN ERY	15	
_9085120497_	card	_4011765263_	1/19/1995	bl	sau	+	P E	PEN ERY	15	
_1238843072_	er	_9921932435_	1/1/1995	fl	sau	+	P E R	PEN ERY CIP	12	
_2109398192_	med1	_9565564435_	1/4/1995	wd	sau	+	P E R	PEN ERY CIP	12	
_2232381088_	neuro	_5196466391_	1/23/1995	bl	sau	+	P E R	PEN ERY CIP	11	
_3517258939_	er	_9598120009_	1/15/1995	ur	sau	+	P E R	PEN ERY CIP	9	
_4573515957_	neuro	_5723451965_	1/31/1995	sp	sau	+	P E R	PEN ERY CIP	16	
_4849168779_	med1	_8122545878_	1/3/1995	no	sau	+	P-E R	PEN -- ERY CIP	9	
_0844575655_	med2	_0160995773_	1/25/1995	sp	sau	+	P EC R	PEN ERY CLI CIP	14	
_2133666291_	icu1	_3328458297_	1/12/1995	ur	sau	+	P EC R	PEN ERY CLI CIP	14	
_7300786709_	med2	_0426656102_	1/28/1995	sp	sau	+	P EC R	PEN ERY CLI CIP	13	
_1412374929_	oncol	_9806413557_	1/17/1995	wd	sau	+	POEC	PEN OXA ERY CLI	9	
_4025261715_	icu1	_4933799159_	1/19/1995	sp	sau	+	POEC	PEN OXA ERY CLI	11	
_1608132686_	card	_7019045586_	1/9/1995	sp	sau	+	POEC R	PEN OXA ERY CLI CIP	10	
_9876786254_	med1	_3984609303_	1/3/1995	wd	sau	+	POEC R	PEN OXA ERY CLI CIP	10	
_1013605973_	card	_1920548872_	1/5/1995	sp	sau	+	P ECGTR	PEN ERY CLI GEN SXT CIP	15	
_0844575655_	op	_0160995773_	1/25/1995	ur	sau	+	POE GTR	PEN OXA ERY GEN SXT CIP	6	
_1137685856_	op	_5108867058_	1/13/1995	ur	sau	+	POECGTR	PEN OXA ERY CLI GEN SXT CIP	6	
_1238843072_	op	_4268300617_	1/26/1995	ur	sau	+	POECGTR	PEN OXA ERY CLI GEN SXT CIP	6	
_1346406050_	oncol	_2253236234_	1/6/1995	ur	sau	+	POECGTR	PEN OXA ERY CLI GEN SXT CIP	6	
_5068601306_	oncol	_2749692996_	1/13/1995	sp	sau	+	POECGTR	PEN OXA ERY CLI GEN SXT CIP	6	

This listing is very similar to the one you did in Data analysis 1 with the analysis option "Isolate listing and summary". But there are two additional columns: "Profile" (using one-letter antibiotic codes) and "Resistance profile" (using three-letter antibiotic codes). These columns indicate the multi-resistance pattern of the isolates. The profiles indicate the drugs to which the isolate is either resistant or intermediate (*i.e.* non-susceptible). For example "PE" = "PEN ERY" = isolates non-susceptible to penicillin and erythromycin, but susceptible to the other drugs requested.

Completely susceptible isolates appear at the top of the listing, followed by isolates non-susceptible to one drug, then to two drugs, *etc.* Multi-resistant strains appear at the bottom of the listing. This analysis thus categorizes all of the observed isolates according to resistance phenotype. If a patient has multiple isolates, you can see whether the isolates have the same resistance phenotype, or whether the phenotype changes over time, for example accumulating mutations, resistance genes, and plasmids. By examining the dates and the room numbers, you may also detect possible outbreaks of certain strains of *S. aureus* as defined by their multi-resistance pattern.

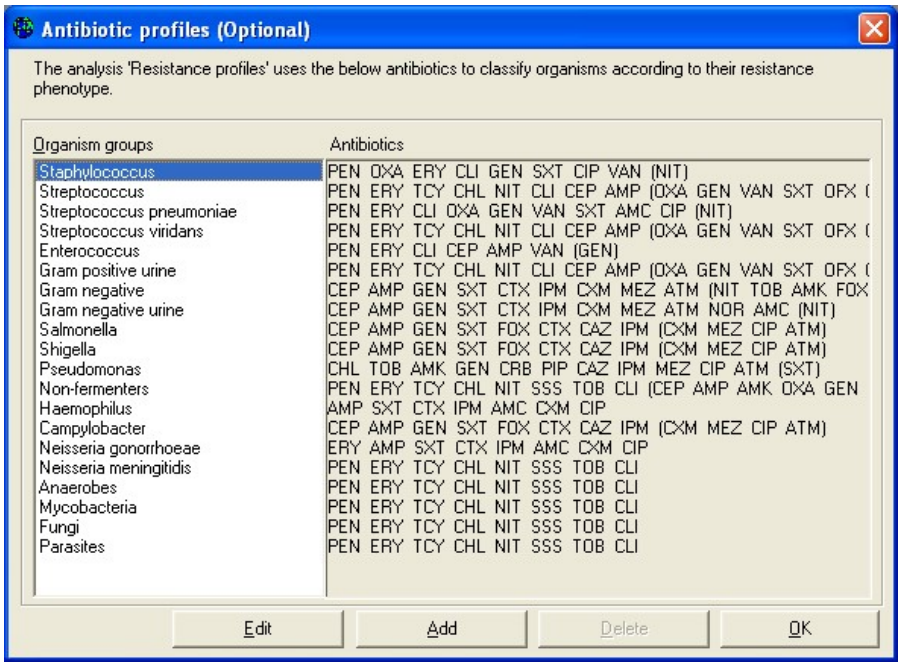
Click on "Continue" to see a summary of this list.



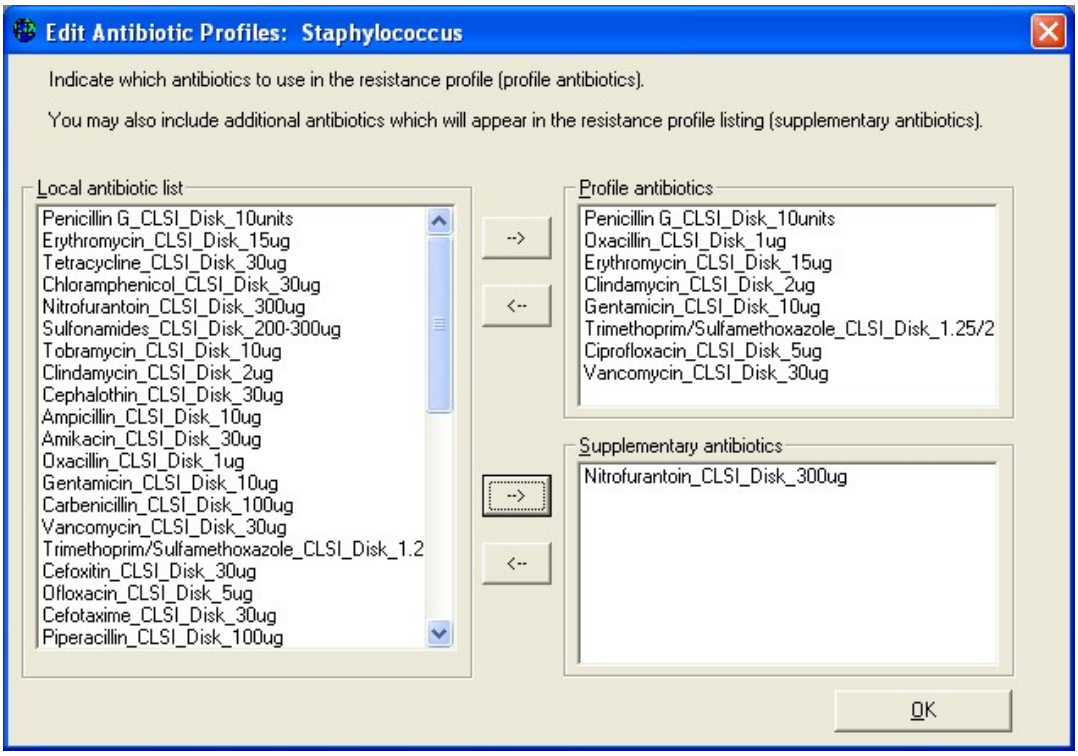
This output summarizes findings for all resistance phenotypes observed in the database. In this sample database, you will see that the most common phenotype is pan-susceptible (susceptible to all drugs requested) followed by "PEN" (non-susceptible to penicillin). Among MRSA isolates, the most common phenotype is "PEN OXA ERY CLI GEN SXT CIP", in other words non-susceptible to all drugs requested with the exception of vancomycin. The day-by-day distribution of this MRSA phenotype is shown in the graph.

Click on “Continue” to return to the main menu.

In this analysis, WHONET did not analyze results for all of the drugs tested again *S. aureus*. Instead, WHONET used the drugs indicated in the laboratory configuration. To see and modify the drugs used for this analysis, click on “Analysis type” and “Edit profiles”.



This list indicates which antimicrobials will be used, by default, for each organism group. For the item “Staphylococcus”, click on “Edit”.



On this screen, you can select the drugs to use for the resistance profiles. Drugs in the box “Profile antibiotics” will be used to define the resistance phenotype. Drugs appearing under “Supplementary antibiotics” will appear in the line-listing, but are not used to define the resistance phenotype.

Note: Any modifications that you make to the profile antibiotics while you are in the Data analysis area of WHONET will be forgotten as soon as you leave WHONET. Any edits that you do here are temporary. To save the changes permanently for future use, you will need to use the WHONET configuration program. To do this, you will need to go back to the main WHONET screen and select “Modify laboratory” and “Antibiotics”. You will see a button called “Profiles”. After you change the profile antibiotics, click on “Save” to save them into your laboratory configuration.