

Visualization in Clinical Decision Support Systems for Antibiotic Treatment

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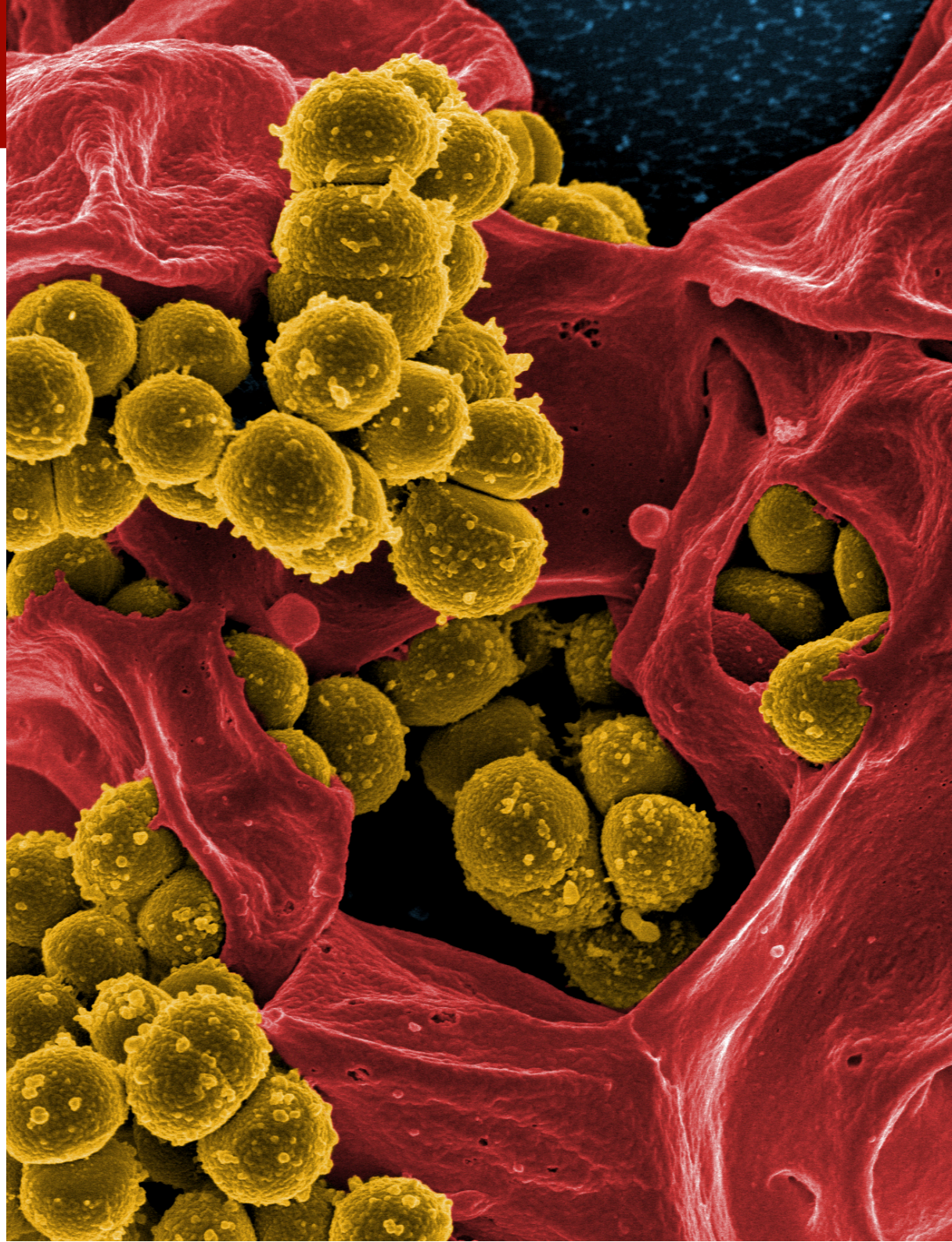
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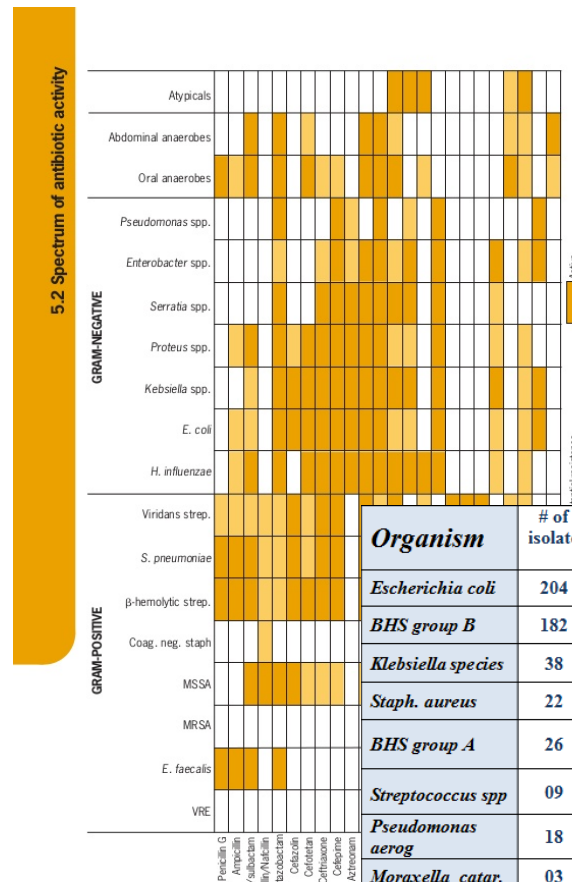
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CONTEXT

- **ANTIBIOTICS:**
 - BACTERIAL INFECTIONS
 - USE vs. EFFECTIVENESS
 - RESISTANCE
 - HAIs (nosocomial)
- **USE POLICIES**
 - Intl. organisms
 - Effectiveness/Resistance
 - Inappropriate/unnecessary



- **ANTIBIOGRAM**
(the bird view)
 - Susceptibility
 - Resistance
 - Organisms x AB
 - CLSI



Johns Hopkins
Antibiotic Guideline
2013. Pp. 13.

St. Annes Hospital Antibioqram from Jan-Jun 2006

St. Annes Hospital - Fall River, MA

Antibiogram for

1/01/06 to 6/30/06

	# of isolates	Amox/Clav	Ampicillin	Ampicillin/Sulbactam	Aztreonam	Cefazolin	Cefazidime	Ceftriaxone	Cefuroxime	Ciprofloxacin	Clindamycin	Erythromycin	Gentamicin	Imipenem	Levofloxacin	Linezolid	Oxacillin	Penicillin	Pipercillin	Ticarc/Clav (Trim)	Tobramycin	Trimeth/Sulfa	Vancomycin
Numbers are the % of isolates susceptible / systemic infections																							
GRAM NEGATIVE																							
E. coli	485	95	62	65	97	94	98	98	95	88			94	99	88				64	93	94	86	
Kl. oxytoca	24	79	8	62	83	46	79	83	79	75			88	100	92				58	67	75	88	
Kl. pneumoniae	108	99	10	87	95	94	95	95	90	94			96	100	95				83	94	95	91	
Pr. mirabilis	58	100	82	83	94	92	100	100	100	85			83	100	86				83	100	85	86	
P. aeruginosa	66				74		93	29	74				84	88	74				95	90	97		
GRAM POSITIVE																							
E. faecalis	138		98						57		6			60	99		99						100
E. Faecalis VRE	4		100						0		0			0	100		100						0
E. faecium	18		21						16		8			16	100		16						100
E. faecium VRE	30		17						0		0			0	100		14						0
S. agalactiae	60		100							85				100	100		100						100
S. aureus	130	98	18	98		99	99	87	86	75	100		86	100	100	18						100	100
S. aureus MRSA	151	0	0	0		0	0	23	35	7	99		25	100	0	0						99	100
S. epidermidis	78	22	3	22		21	21	23	48	21	67		24	100	22	3						50	100
S. pneumoniae	17	100						88			94			100	100		81					88	100

Organism	# of isolates	AM	CIP	LE	CX	CF	CR	CAZ	CEC	NO	F	AM	CLA	CP	PE	E
<i>Escherichia coli</i>	204	76	82	82	79	79	79	-	84	88	90	-	-	90	92	-
<i>BHS group B</i>	182	100	10	09	98	68	95	-	-	-	100	100	74	85	-	-
<i>Klebsiella species</i>	38	86	92	92	84	86	86	-	93	98	62	-	-	93	98	-
<i>Staph. aureus</i>	22	88	73	73	88	10	88	-	-	-	86	-	-	91	100	52
<i>BHS group A</i>	26	100	35	12	100	82	100	-	-	-	-	100	-	-	-	-
<i>Streptococcus spp</i>	09	100	12	10	83	30	100	-	-	-	-	100	-	100	-	90
<i>Pseudomonas aerog</i>	18	36	99	88	44	42	54	85	85	-	52	-	-	92	100	-
<i>Moraxella catar.</i>	03	100	70	70	100	93	100	-	-	-	-	100	-	-	-	55
<i>Haemophilus spp</i>	06	100	79	79	100	70	100	-	-	-	-	100	-	-	-	52
<i>Enterobacter spp</i>	03	33	67	67	67	67	67	-	70	100	50	-	-	100	75	-
<i>Proteus spp</i>	05	80	100	100	100	100	100	-	-	100	20	-	-	100	100	-
<i>Citobacter koseri</i>	05	80	100	80	80	80	100	-	-	100	80	-	-	100	100	-

Antibiotic susceptibility profile at Cure, May- Sept. 2012
S. Abbasi & A. Howedy

- Defeat or not defeat (the microorganism), that's the question:

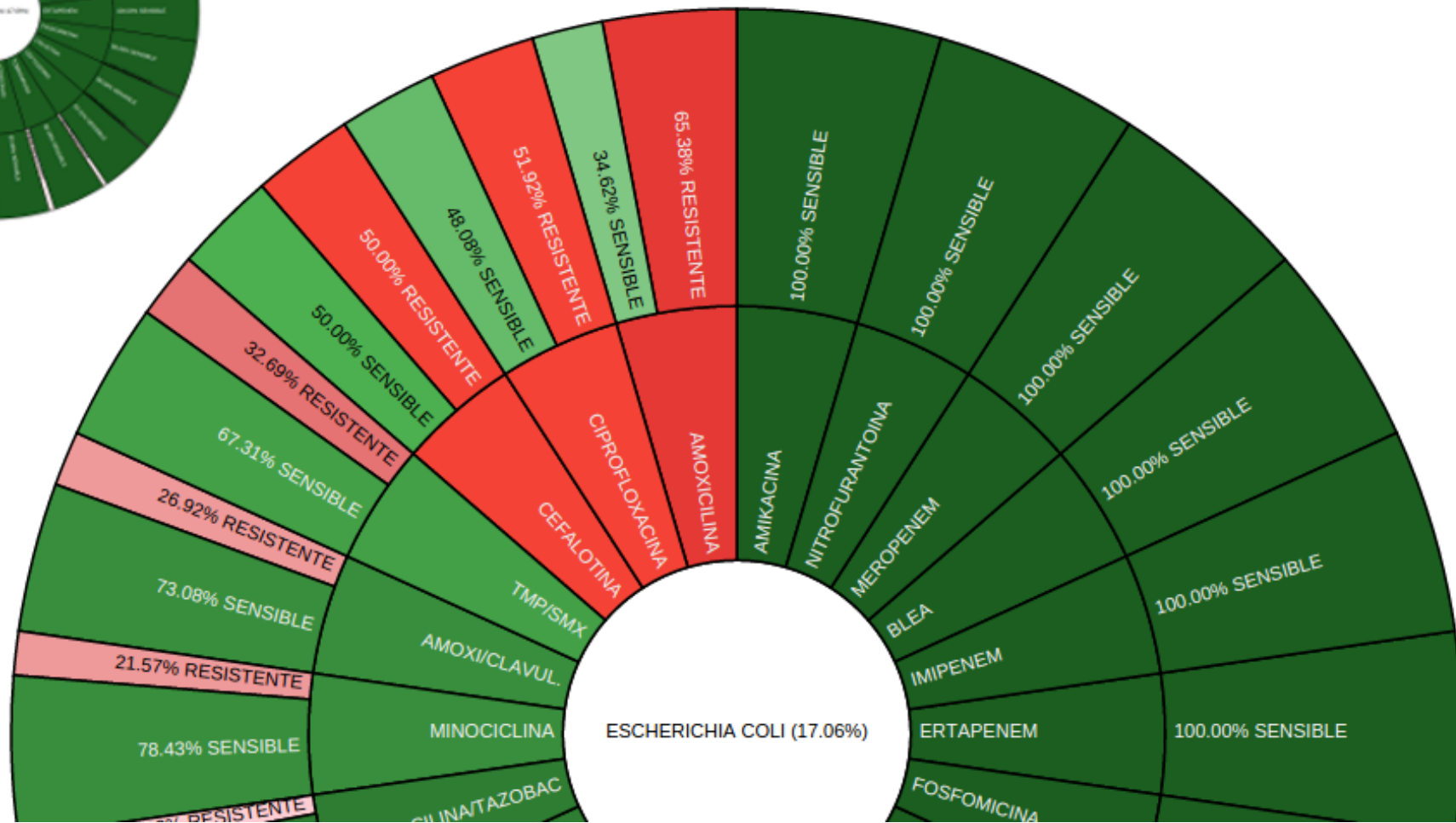
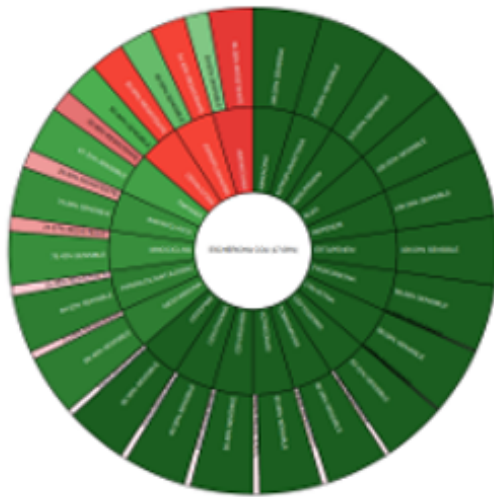
$$Prevalence(M_i) = \frac{M_i}{|M|} \cdot 100.$$

$$Sensitivity(M_i, A_j) = \frac{S_{i,j}}{S_{i,j} + R_{i,j}} \cdot 100$$

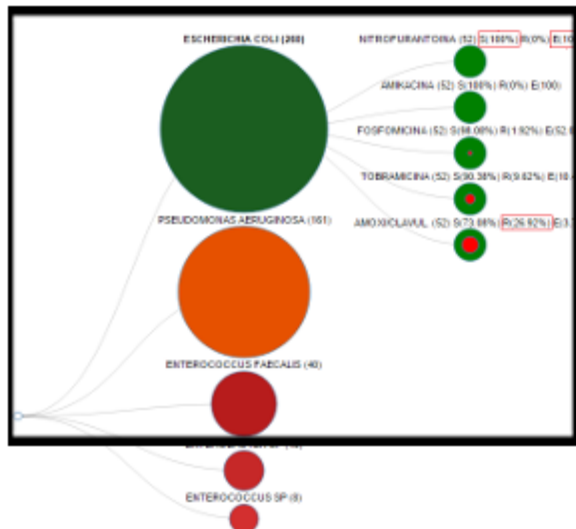
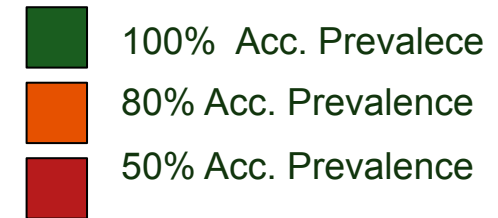
$$Resistance(M_i, A_j) = \frac{R_{i,j}}{S_{i,j} + R_{i,j}} \cdot 100$$



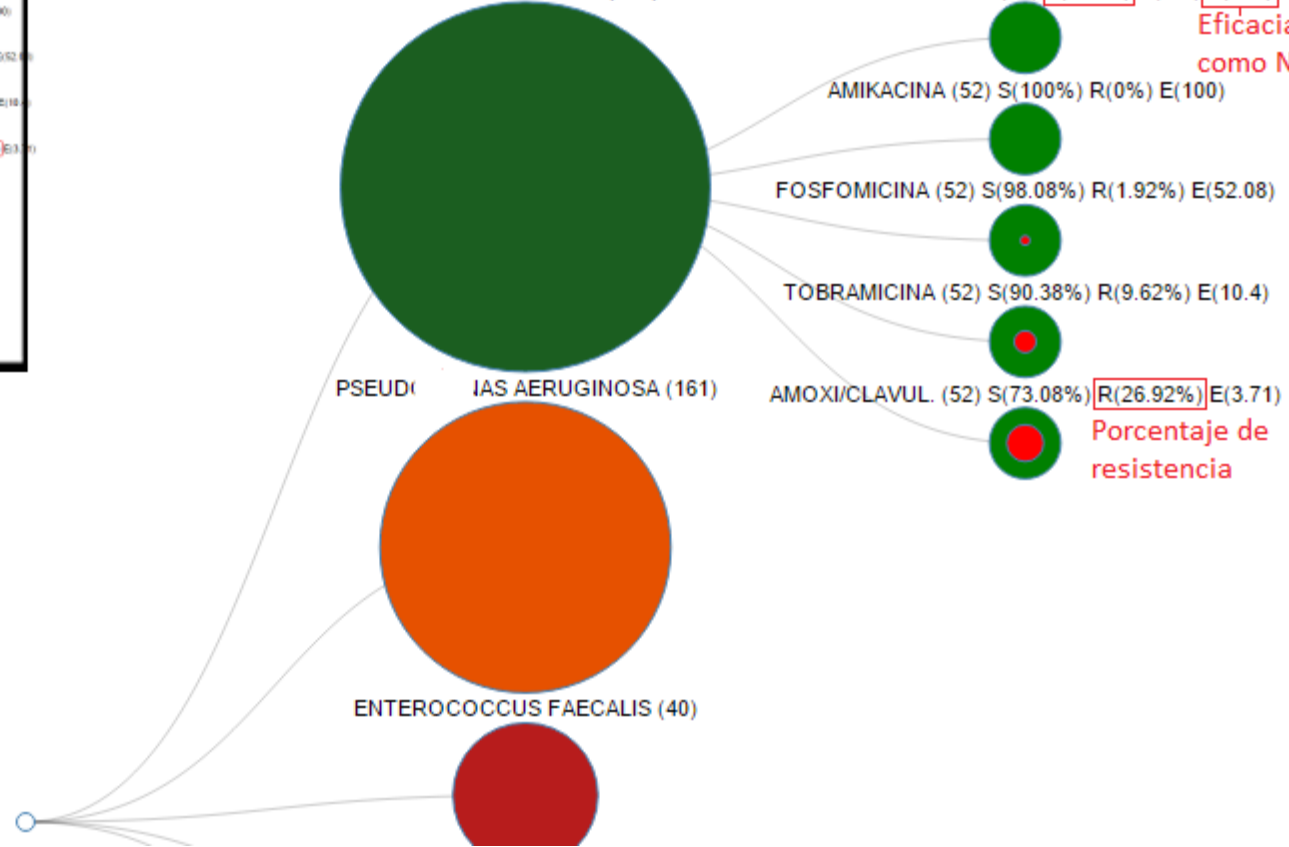
- Sunburst Model Extension:



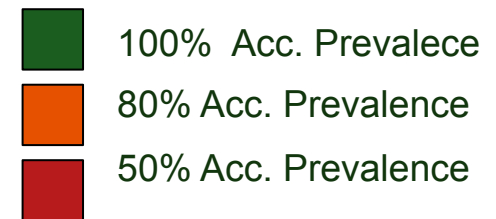
• Tree Model Extension



Nº muestras: 484 Sensibles y resistentes
ESCHERICHIA COLI (260)



- Bipartite Extension:**



Nº muestras: 315
Microorganismo

Cuenta

Sensibles

Antibiótico

Cuenta

%S

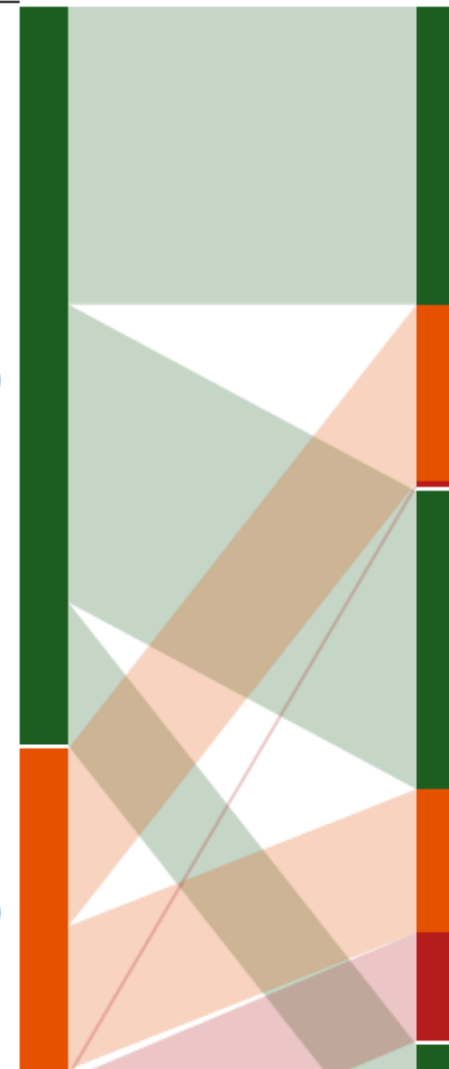
NNF

ESCHERICHIA COLI 129 (60.28%)

STAPHYLOCOCCUS AUREUS 56 (26.17%)

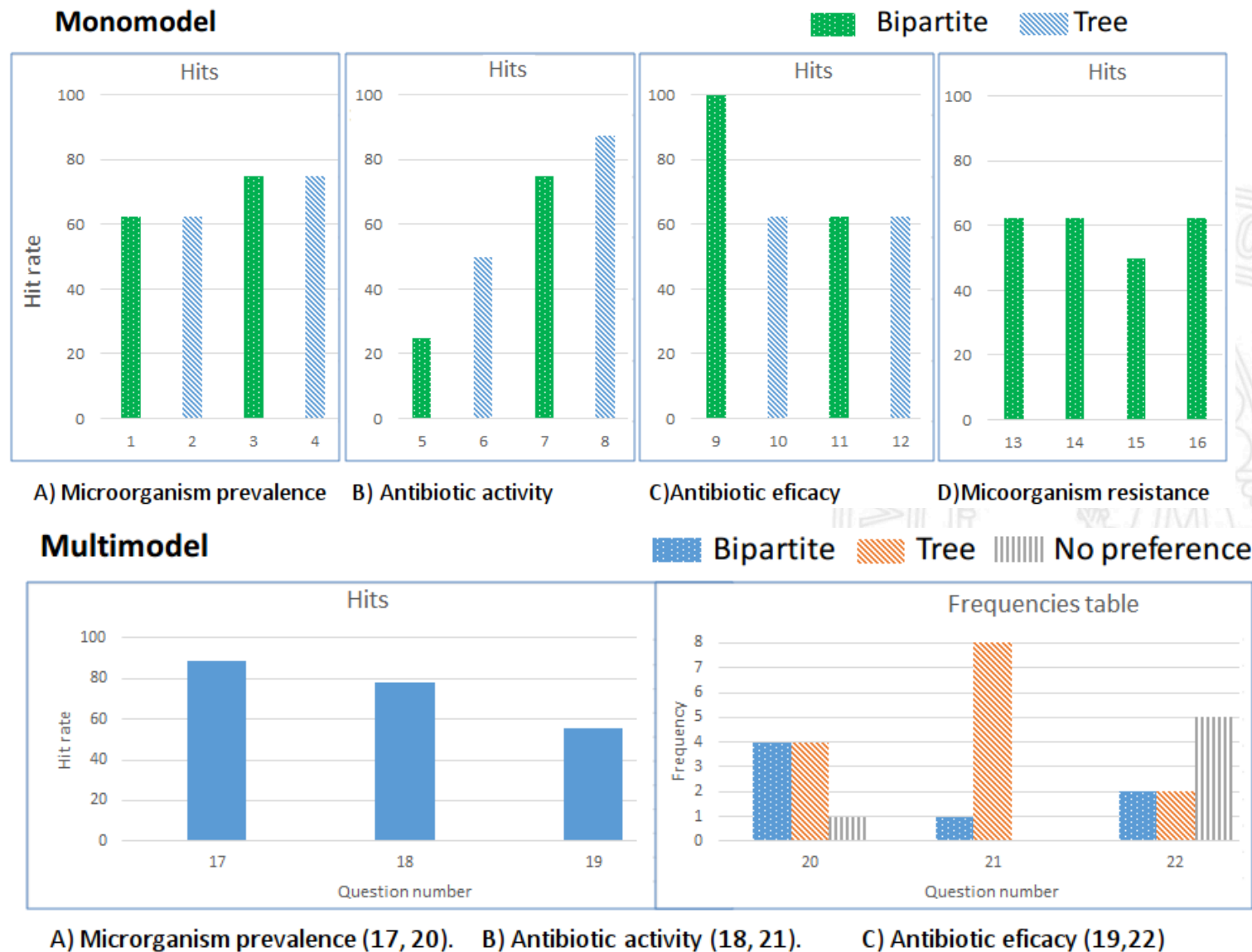
NITROFURANTOINA84 (39.25%) - 69.52

AMIKACINA 96 (44.86%) - 51.3



• EVALUATION: UP & UE

– Results:



THANK YOU FOR YOUR ATTENTION

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WEB PROJECT: WWW.UM.ES/WASPSS

