

HUSRES Annual Report 2009

Martti Vaara



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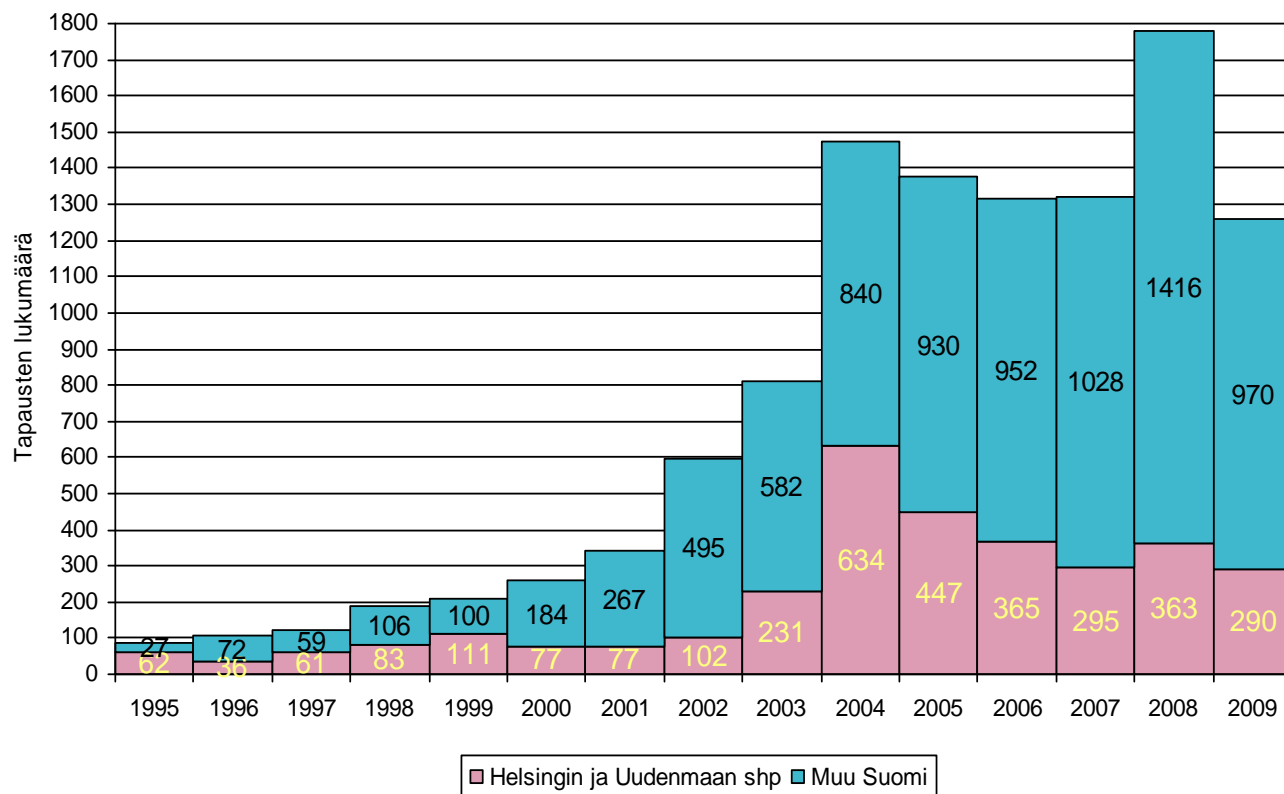
The basis of this HUSRES 2009 report is the HUSLAB/Whonet database 2009, which contains susceptibility data on more than 180.000 bacteria isolated and studied in 2009 by HUSLAB.

The isolates originate from patients in Helsinki University Hospital, other hospitals in Helsinki - Uusimaa region as well as outpatient health centers.

HUSRES 2009 report contains data on 31 clinically most important bacterial species/groups.

Previous annual reports from 2000 are also located at www.huslab.fi

MRSA-löydökset pääkaupunkiseudulla ja muualla Suomessa 1995 – 2009



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Lähde: Valtakunnallinen tartuntatautirekisteri

Staph. aureus 2009 (%R+I)

Pus and blood isolates at seven hospitals (M,T,L,K,N,Kä,Sä) in Helsinki University Central Hospital, from out-patients and from other sources. One isolate per patient (the most resistant).
MRSA screenings excluded

Material	n	Oxa	Ery	Cli	Lev	Rif	Fus	Tob	Net	Lnz	SxT
HUCH (7 hosp)	2232	6	8	6	4	0	6	3	0	0	0
Blood isolates	334	1	5	4	2	0	5	1	0	0	0
Jorvi Hospital	560	4	8	7	4	0	5	2	0	0	0
Peijas Hospital	302	4	6	5	5	0	7	2	0	0	0
Hyvinkää Hosp	295	3	6	5	5	0	3	7	0	0	2
Helsinki City H	561	4	8	6	6	0	5	3	0	0	0
Outpatients	2959	3	6	5	3						
All sources	7542	4	7	5	3	0	6	2	0	0	0

Staph. epidermidis 2009 (%R+I)

Pus and blood isolates. HUSLAB material from hospitals in Helsinki and Uusimaa districts. One isolate per patient (the most resistant)

Material	n	Oxa	Ery	Cli	Lev	Rif	Fus	Tob	Net	Lnz	SxT
Meilahti hosp.	580	81	64	55	60	19	60	46	9	0	45
Childrens' hosp	146	84	68	59	33	10	75	61	14	0	60
All sources	2144	71	58	48	46	15	55	39	7	0	40

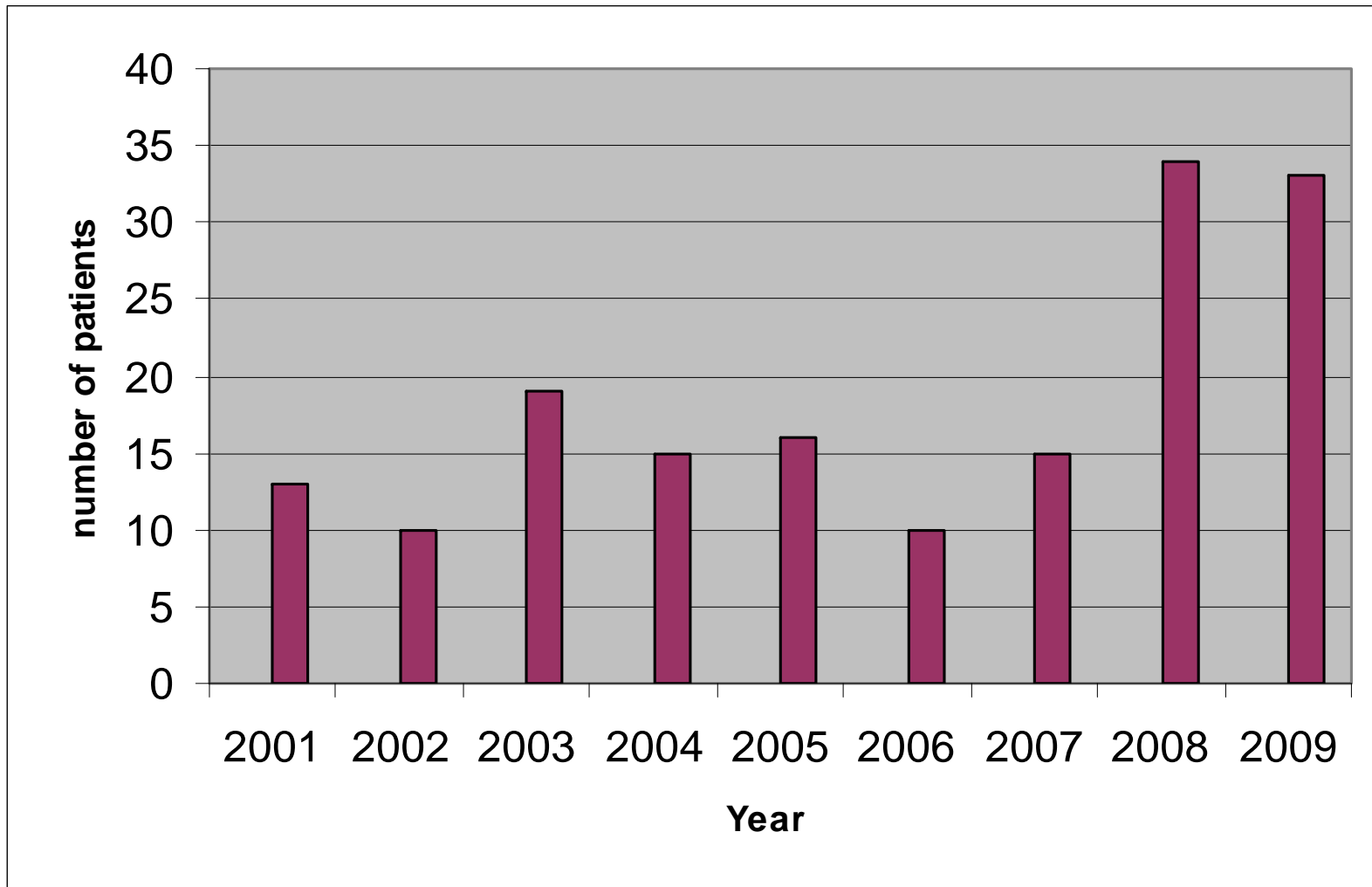
Streptococcus pneumoniae 2009 (%R+I)

HUSLAB material from Helsinki and Uusimaa districts. One isolate per patient (the first isolate)

	All	Blood
Penicillin - R	2,7	1,7
Penicillin - I	13,9	10,4
Ceftriaxone - R	0,0	0
Ceftriaxone - I	0,5	0
Erythromycin	28	27
Clindamycin	10	6
Doxycycline	14	
Sulphamet-Trim.	31	
Levofloxacin		0,5
Moxifloxacin		0,0
Telithromycin		0,0
<i>n</i>	818	231

Multiresistant* pneumococci 2001-2009

HUSLAB material from Helsinki and Uusimaa district



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Multiresistant pneumococci 2008-2009

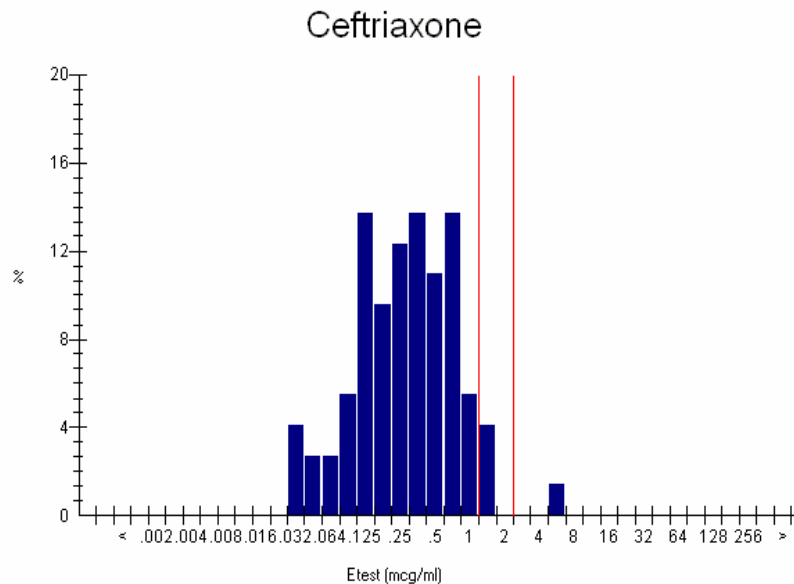
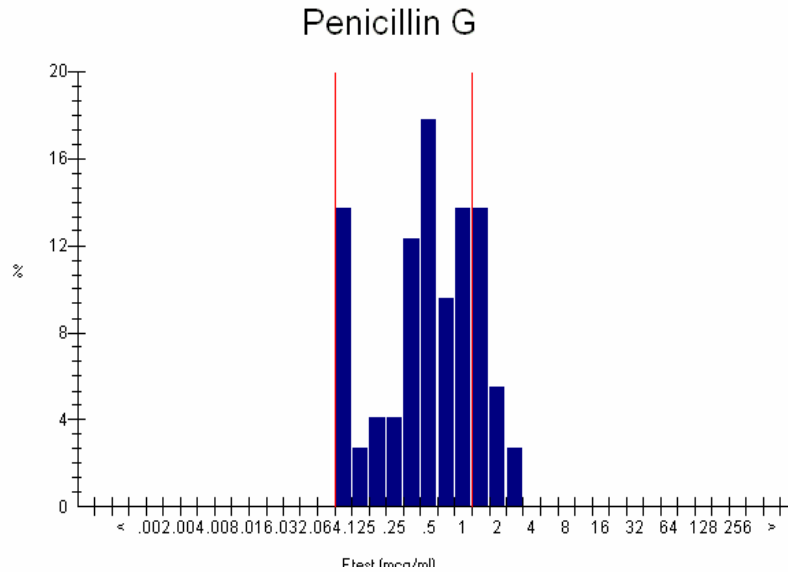
Proportion (%) in different age groups. HUSLAB material

Age (years)	%	n
< 1	6,9	12/173
1-3	6,9	23/334
4-10	2,9	5/171
11-20	0,0	0/87
21-40	3,4	10/295
41-60	2,9	10/339
61 -	3,4	12/349

Multiresistant pneumococci 2008-2009

MIC distribution for penicillin G and ceftriaxone

HUSLAB material, n = 73



Beta-hemolytic streptococci 2009 (%R+I)

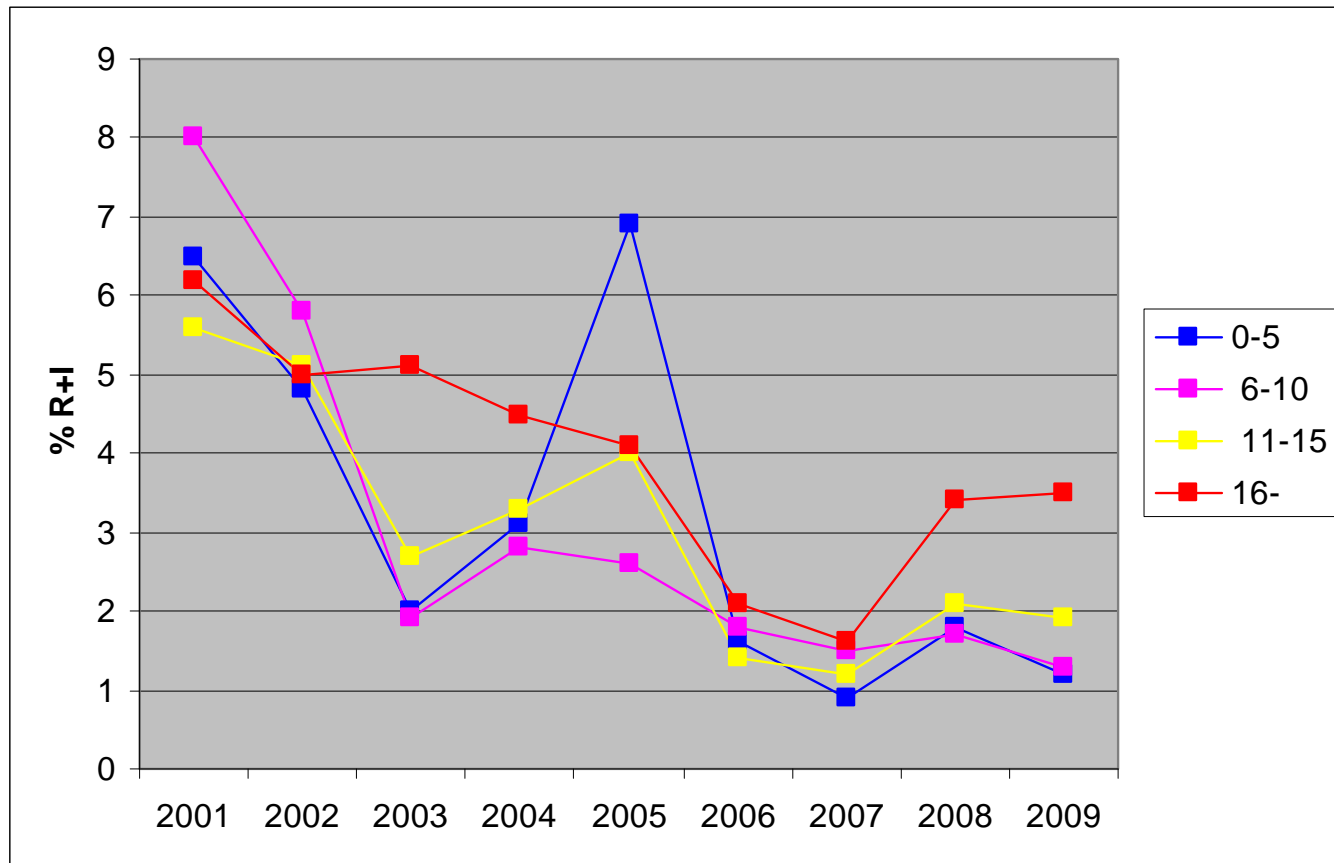
HUSLAB material from Helsinki and Uusimaa Districts.
One isolate per patient (the first isolate)

	S. pyogenes	S. agalact.	Group G
Penicillin	0	0	0
Cephalosp. I gen	0	0	0
Erythromycin	3	11	11
Clindamycin	2	10	10
n	8329	4696	4121

Group G: *S. dysgalactiae* spp. *equisimilis* group G strains

S. pyogenes, resistance of erythromycin in different age groups

HUSLAB material from Helsinki and Uusimaa district



Streptococcus viridans group, blood isolates 2009

HUSLAB material from Helsinki and Uusimaa Districts.
One isolate per patient (the first isolate)

Penicillin -I	19
Penicillin -R	2
Ceftriaxone -I	0
Ceftriaxone -R	1
Erythromycin I+R	24
Clindamycin	5
Gentamycin -high res.	0
Vancomycin	0

n = 127

Str. anginosus [milleri] group 2009 (%R+I)

Pus and blood isolates, HUSLAB material from Helsinki and Uusimaa Districts.
One isolate per patient (the first isolate)

n = 631

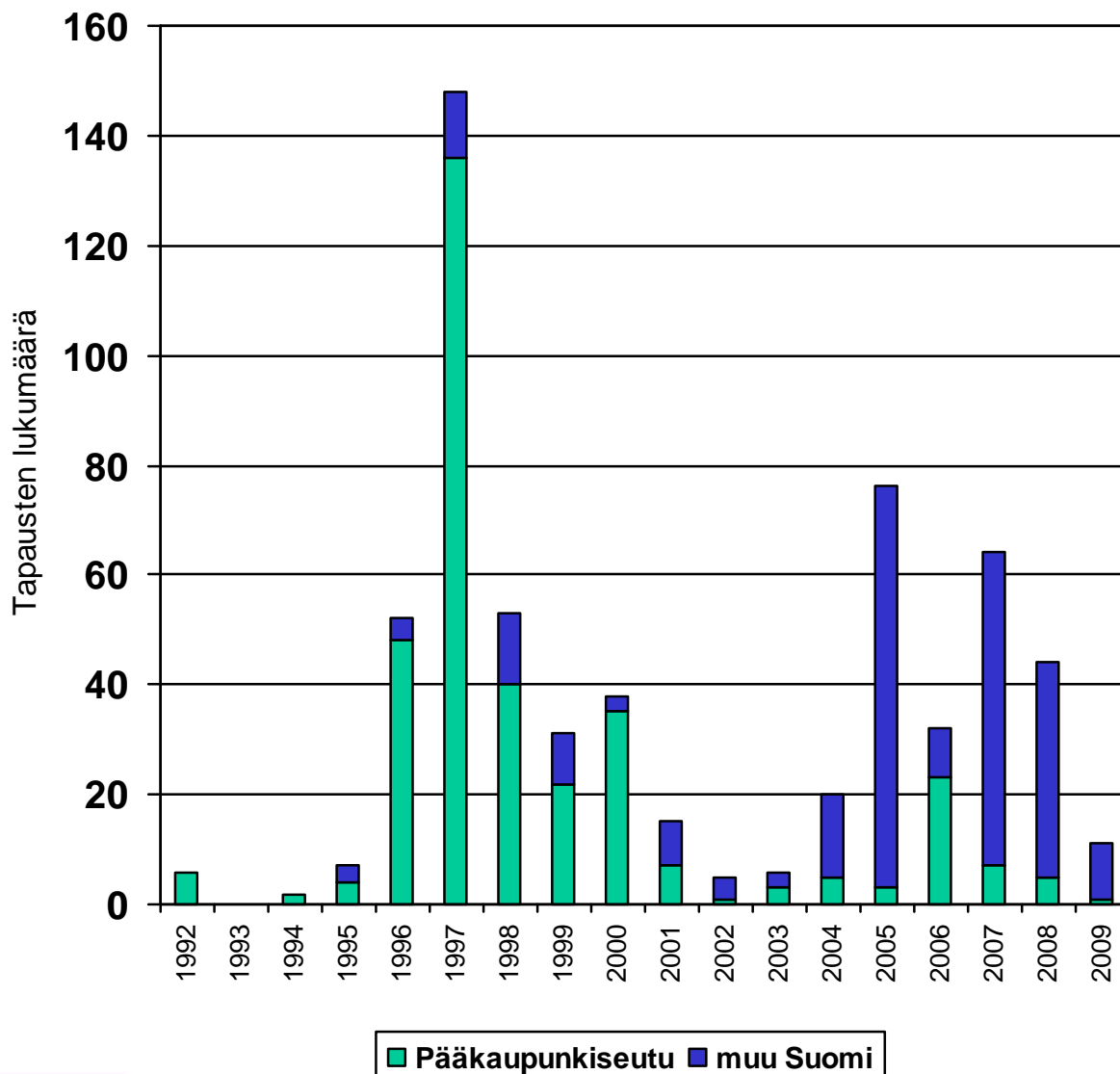
Penicillin	0
Cephalospor. I gen.	0
Erythromycin	10
Clindamycin	8
Vancomycin	0

E. faecalis and *E. faecium* 2009

%R+I (pus & blood); %R (urine). HUSLAB material from Helsinki and Uusimaa districts. One isolate per patient (the most resistant)

	E. faecalis			E. faecium		
	pus	blood	urine	pus	blood	urine
Ampicillin	0	0	0	95	89	98
Imipenem	0	0		96	89	
Linezolid-I	0	0		0	0	
Linezolid-R	0	0		0	0	
Vancomycin	0	0	0	1	0	0
Gentam. (hi)		15			7	
Levofloxacin		37			96	
Moxiflox MIC_≥8		32			94	
Norfloxacin			24			98
Nitrofurantoin			1			92
SuTri			19			93
n	1327	92	4608	430	56	1101

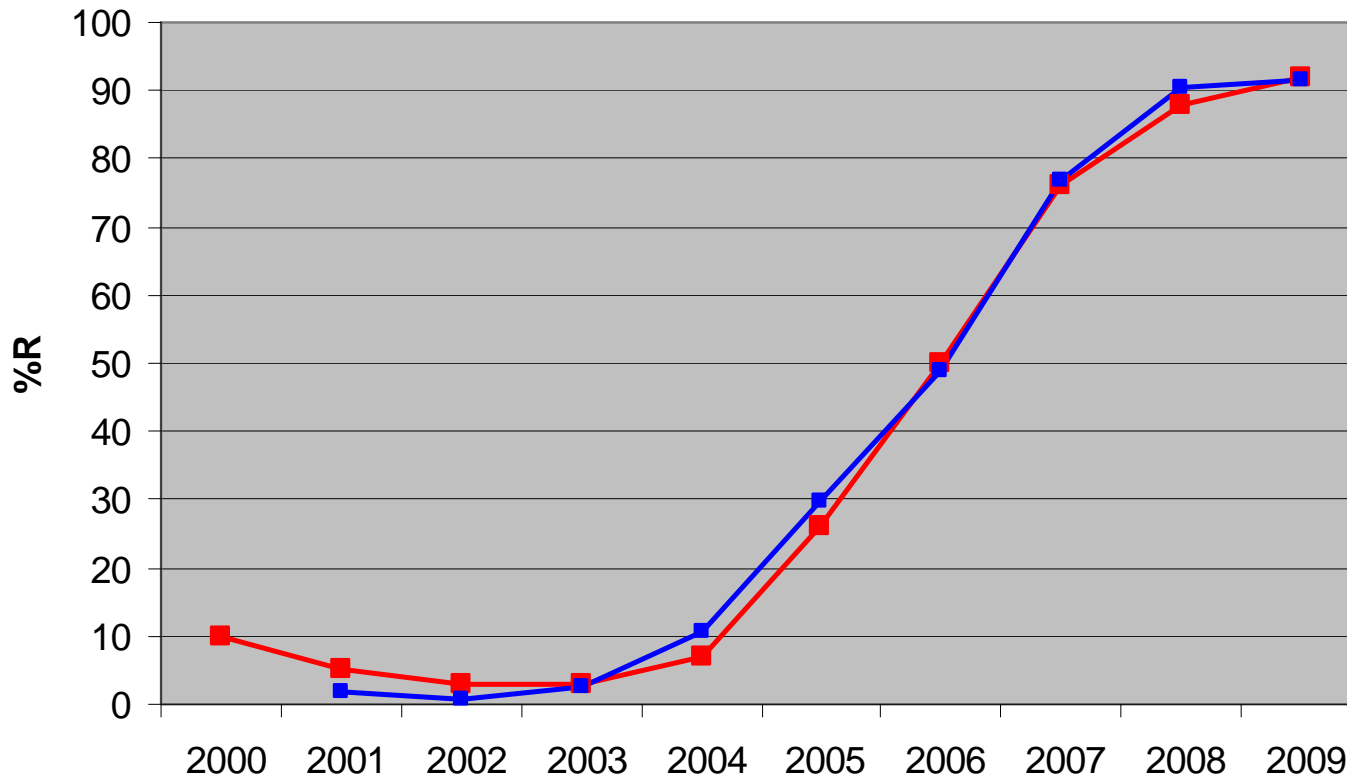
VRE-löydökset Suomessa 1995-2009



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Case: Nitrofurantoin resistance in *E. faecium* 2000-2009

Urine isolates. HUSLAB material from all sources in Helsinki and Uusimaa districts (red) or from Meilahti Hospital (blue)



Number of strains (one isolate per patient [the most resistant]:

	All	MeiS
2000	818	
2001	673	117
2002	786	152
2003	939	147
2004	1055	158
2005	900	134
2006	1003	180
2007	1128	202
2009	1230	199
2009	1099	175

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Pseudomonas aeruginosa 2009 (%R+I)

Pus and blood isolates. One isolate per patient (the most resistant isolate). HUSLAB material from selected hospitals in Helsinki and Uusimaa Districts

Pus isolates from	n	Ctaz	Mero	Pi-Tz	Tob	Ami	Cip
Meilahti	235	11	9	11	8	5	19
Töölö	173	8	10	8	5	5	36
Helsinki City hospitals	195	3	6	4	4	1	21
Jorvi Hospital	169	2	8	3	3	2	18
Peijas Hospital	52	6	2	8	2	2	10
Childrens´	29	7	3	3	3	3	0
Uusimaa regional hospitals	166	7	4	5	6	2	15
Outpat. in Health Cntrs	636	2	2	2	2	1	10

Acinetobacter spp. 2009 (%R+I)

Pus and blood isolates from selected hospitals in Helsinki University Hospital. One isolate per patient (the most resistant)

Hospital	n	Ctaz	Mero	Pi-Tz	Tob	Levo	SuTri
Meilahti	40	18	5	13	13	13	15
Töölö	60	8	5	10	10	13	13
Other sources	144	7	5	8	6	9	12

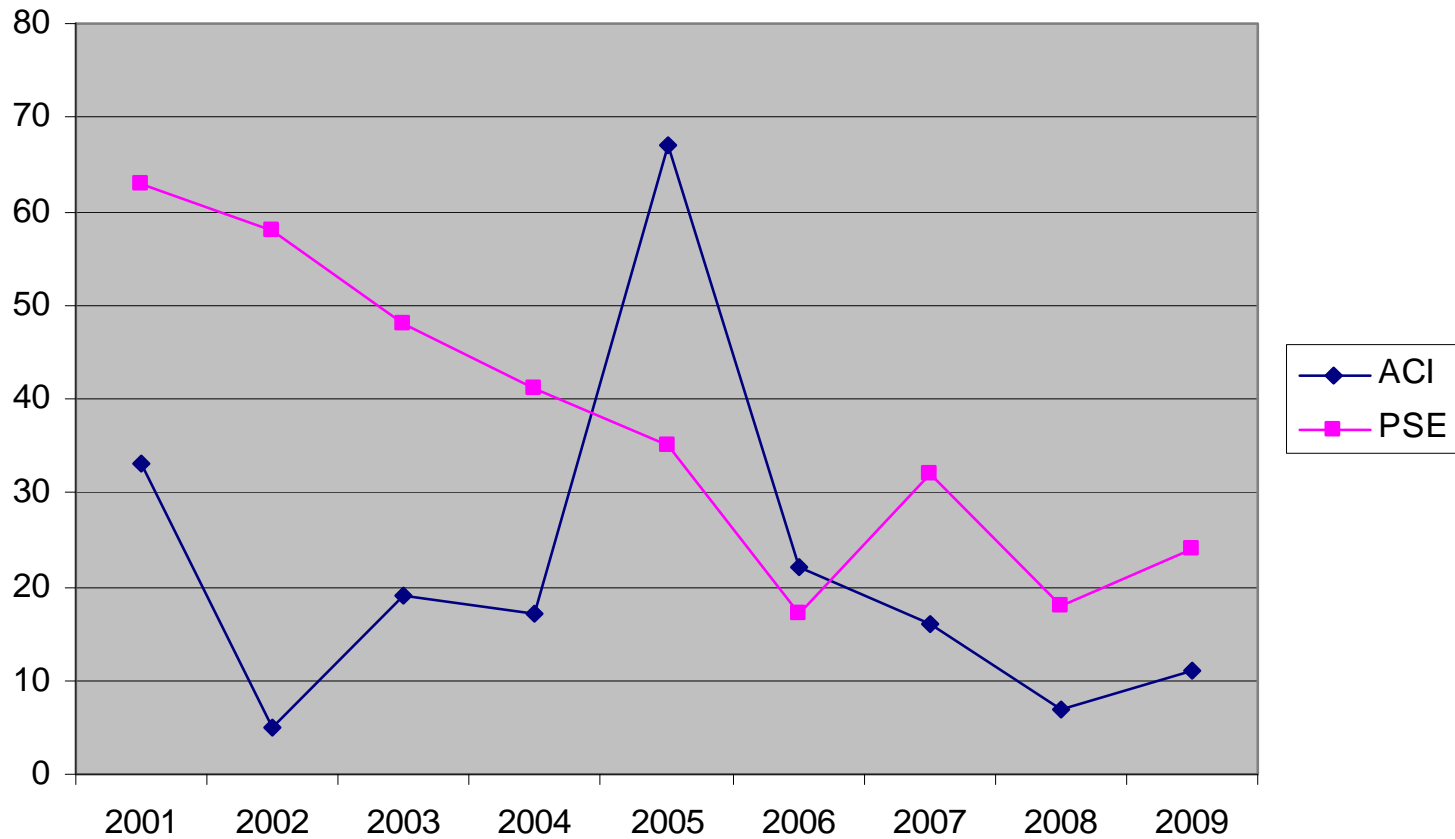
Resistance to meropenem 2001 – 2009 in *Ps. aeruginosa* in Meilahti Hospital and in *Acinetobacter* in Töölö Hospital



One isolate per patient (the most resistant)

Ps. aeruginosa and *Acinetobacter* at HUS, the number of extremely multiresistant isolates

Total number of isolates (one per each patient) that are extremely resistant (resistance to six to five clinically used independent key antibiotics)



Stenotrophomonas maltophilia 2009 (%R+I)

Pus and blood isolates. One isolate per patient (the most resistant isolate).

HUSLAB material from hospitals in Helsinki and Uusimaa Districts

Hospital	n	SxT	Mino	Tige MIC \geq 2	Levo	Tic-cla
Meilahti	101	3	2		18	50
Töölö	62	3	3		15	50
Childrens´	11	18	0		18	33
All sources	390	4	2	59	14	47

All *S. maltophilia* strains display natural resistance (R) to aminoglycosides, carbapenems and piperacillin-tazobactam and are non-susceptible (R or I) to ceftazidime

Enterobacteriaceae 2009 (%R+I)

Pus and blood isolates at seven hospitals (M,T,L,K,N,Kä,Sä) in Helsinki University Central Hospital. One isolate per patient (the most resistant)

	n	Cfur	Ctax	Pi-Tz	Tob	Levo	Mero
E. coli	974	13	9	9*	7	15	0
Kl. pneumoniae	243	13	4	4*	4	7	1
Kl. oxytoca	170	10	2	2*	1	1	0
Proteus mirabilis	108	1	1	1	2	2	0
Ent. cloacae	297	41	30	30**	2	1	0,4
Enterobact. spp.	64	44	36	36**	0	3	0
Citrob. spp.	120	36	25	25**	2	3	0
Serratia marc.	118	99	7	7**	7	4	0
Proteus vulgaris	33	84	7	7**	3	3	0
Morganella morg	58	90	14	14**	2	5	0
Total	2198	26	13	13	5	8	0,2
(Total 2008)	2176	27	13	13	5	7	0,1
(Total 2007)	2693	26	11	11	6	8	0,1
(Total 2006)	2303	24	10	10	5	8	0

*: all ESBL strains reported here as nonsusceptible

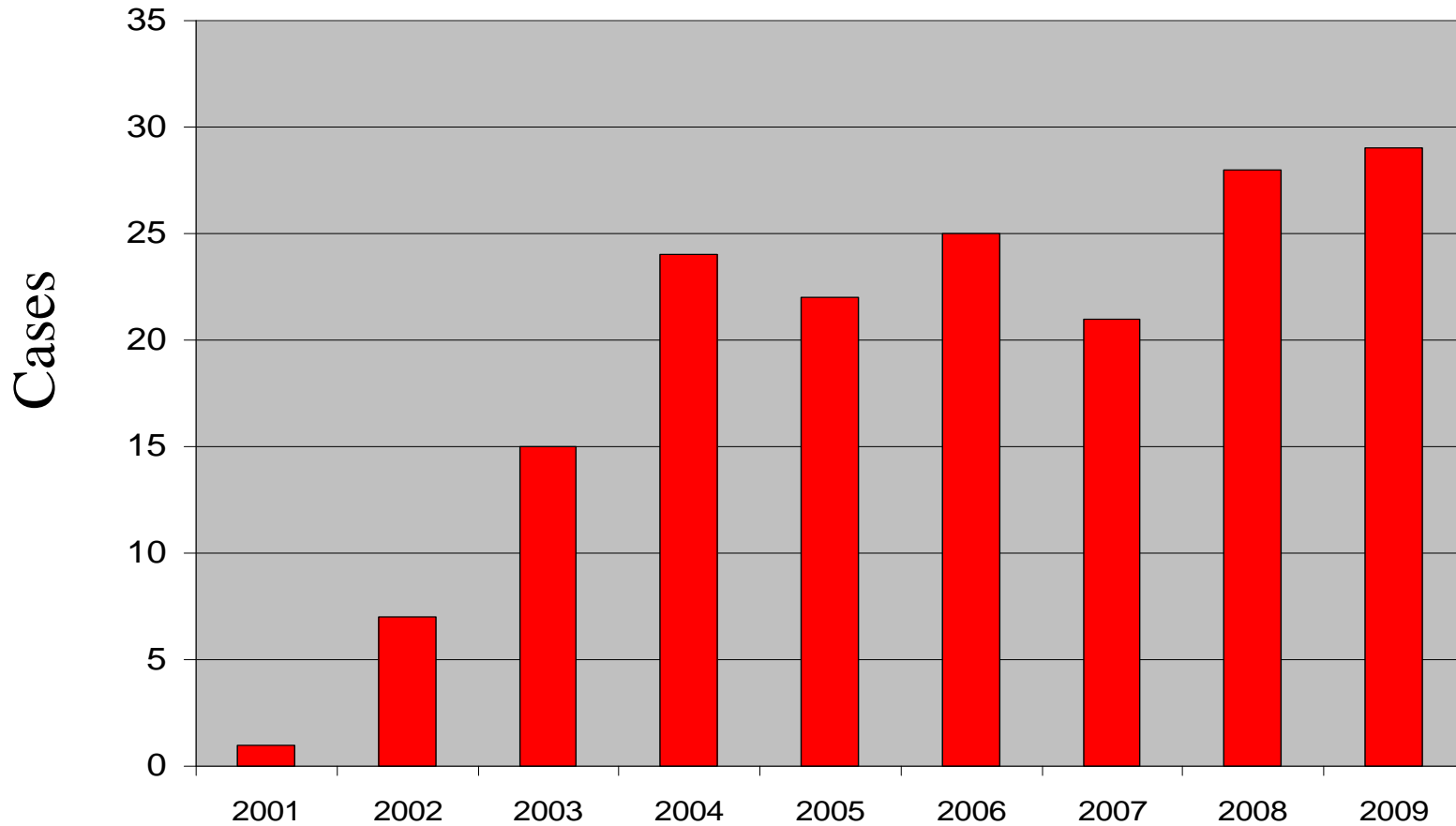
** : all cefotaxime-resistant strains (mainly *ampC* strains) reported as nonsusceptible

ESBL 2009 (% frequency and number of cases) at different locations

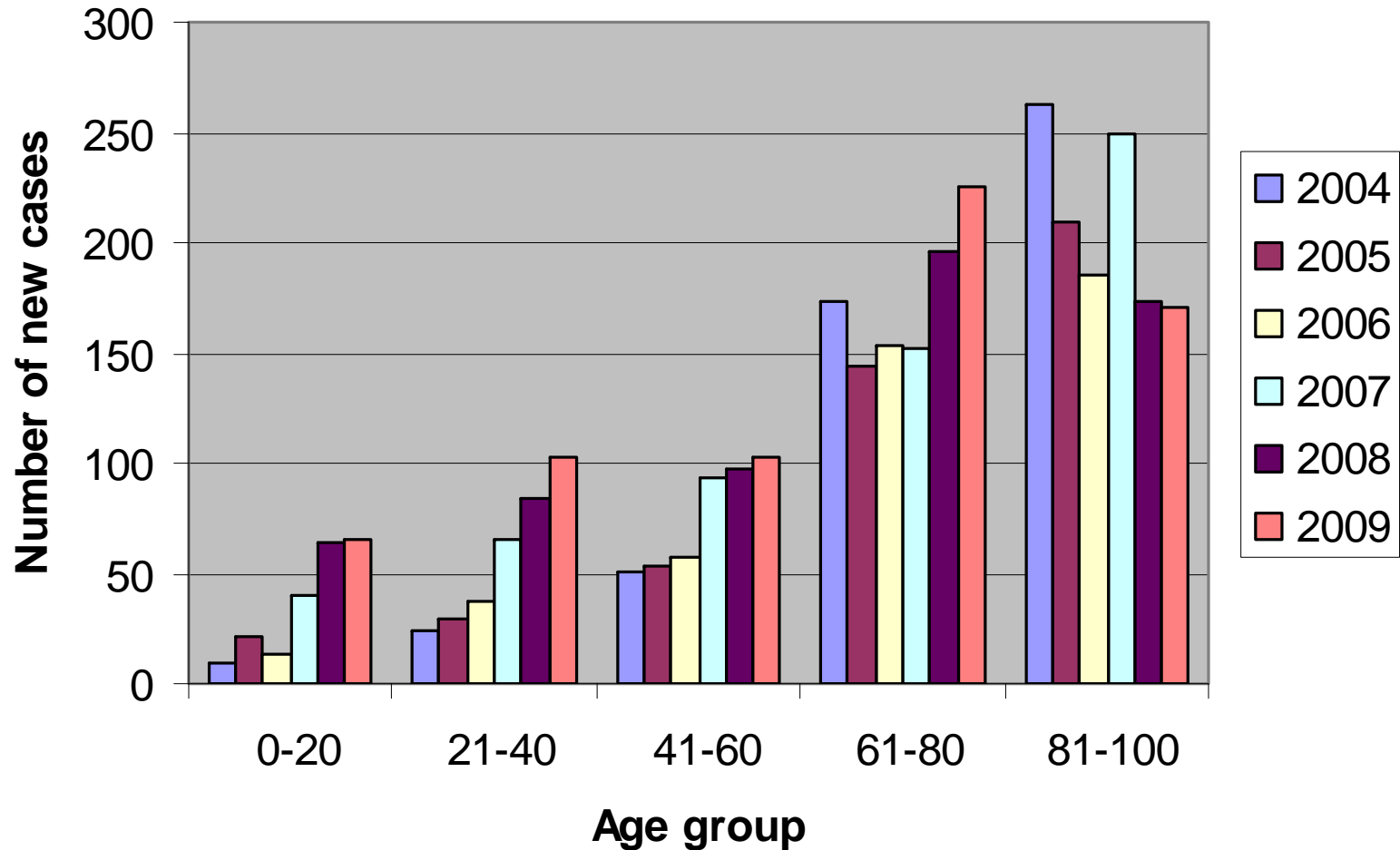
HUSLAB material from Helsinki and Uusimaa districts. One isolate per patient (the most resistant)

Material	E. coli		K. pneumoniae	
	%	no. of patients w. ESBL	%	no. of patients w. ESBL
HUCH, Helsinki (7 hospitals)	5	172	3	18
Helsinki City hospitals	5	175	1	5
Helsinki City outpatients	3	203	1	7
Hyvinkää Regional Hospital	3	43	2	3
Jorvi Hospital	4	41	2	3
Peijas Hospital	4	43	2	5
All sources	3	832	2	56

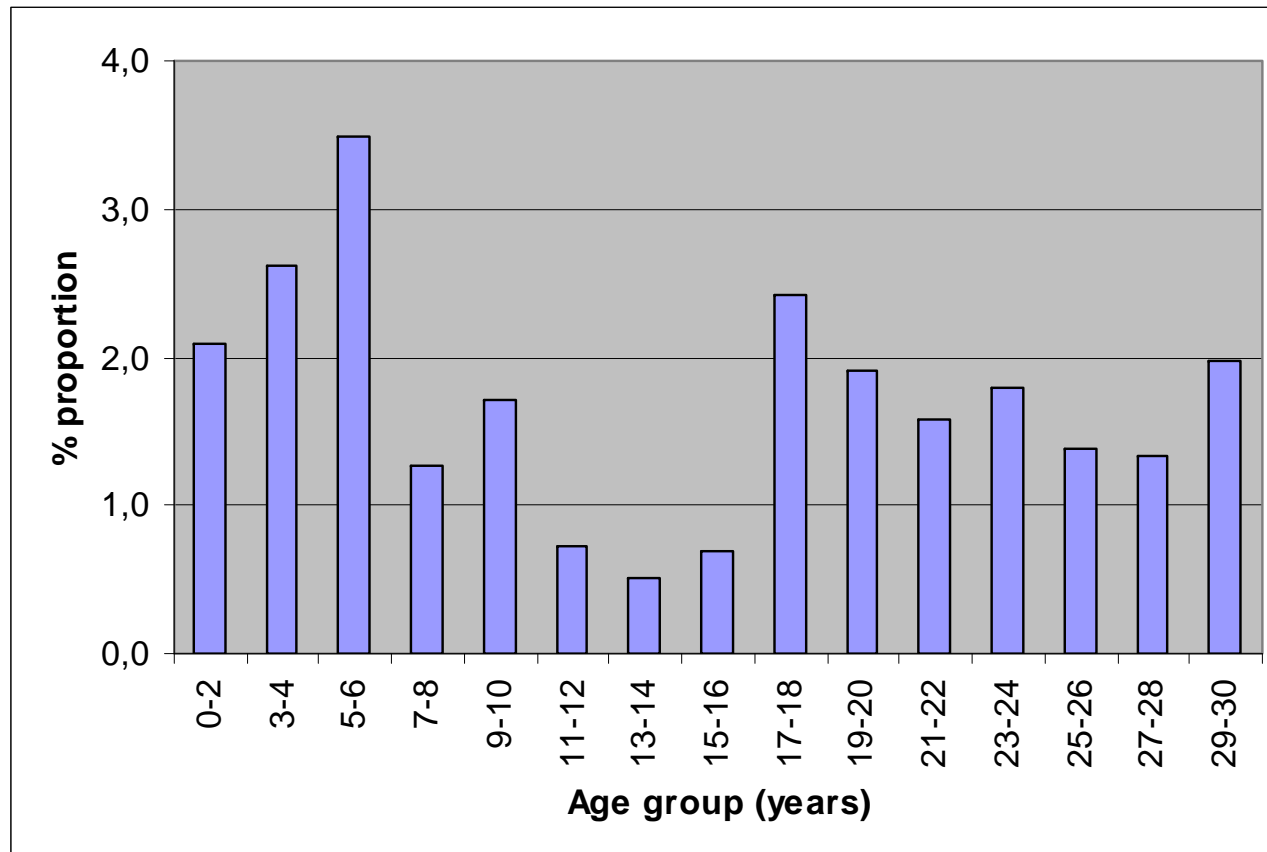
Bacteremias caused by *E. coli* ESBL, HUSLAB material 2001- 2009



E. coli ESBL 2004 – 2009, number of new cases by age categories in Huslab material



E. coli ESBL 2008 – 2009 in age groups up to 30 years, outpatients in Helsinki and Uusimaa Health Centers



Group	n (ESBL)	n (total)
0-2	9	429
3-4	6	229
5-6	9	258
7-8	3	238
9-10	4	233
11-12	1	138
13-14	1	199
15-16	2	286
17-18	15	622
19-20	15	783
21-22	11	695
23-24	12	671
25-26	8	580
27-28	8	597
29-30	10	505

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***E. coli* ESBL 2008 – 2009, resistance to nonbetalactams and carbapenems, age groups 0 - 20 years, outpatients in Helsinki and Uusimaa Health Centers**

Ciprofloxacin	42
Tobramycin	39
Sulphatrimetoprim	63
Trimetoprim	66
Nitrofurantoin	2
Meropenem	0
Imipenem	0
Ertapenem	0
<i>n</i>	65

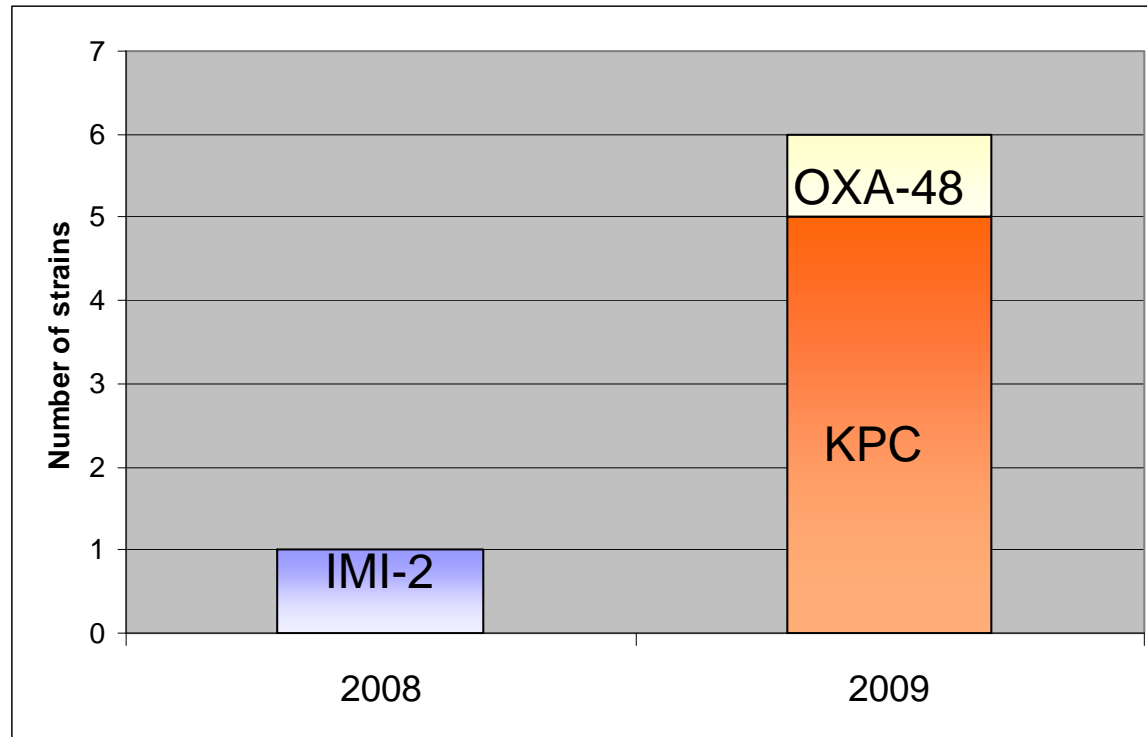
ESBL strains, resistance to non-betalactams and carbapenems 2008 - 2009

% R+I in blood, pus, and urine isolates. HUSLAB material from Helsinki and Uusimaa districts. One isolate per patient (the most resistant isolate)

Antibiotic	E. coli	K. pneum.
Ciprofloxacin	74	60
Levofloxacin	74	60
Tobramycin	53	59
Sulphatrimetoprim	50	71
Trimetoprim	52	73
Nitrofurantoin	6	61
Meropenem	0	7
Imipenem	0	7
Ertapenem	0.9	13
Tigecycline	ND	58 (<i>n</i> = 12)
<i>n</i>	1467	87

Carbapenemase-producing *Enterobacteriaceae* 2008 – 2009

HUSLAB material from Helsinki and Uusimaa district



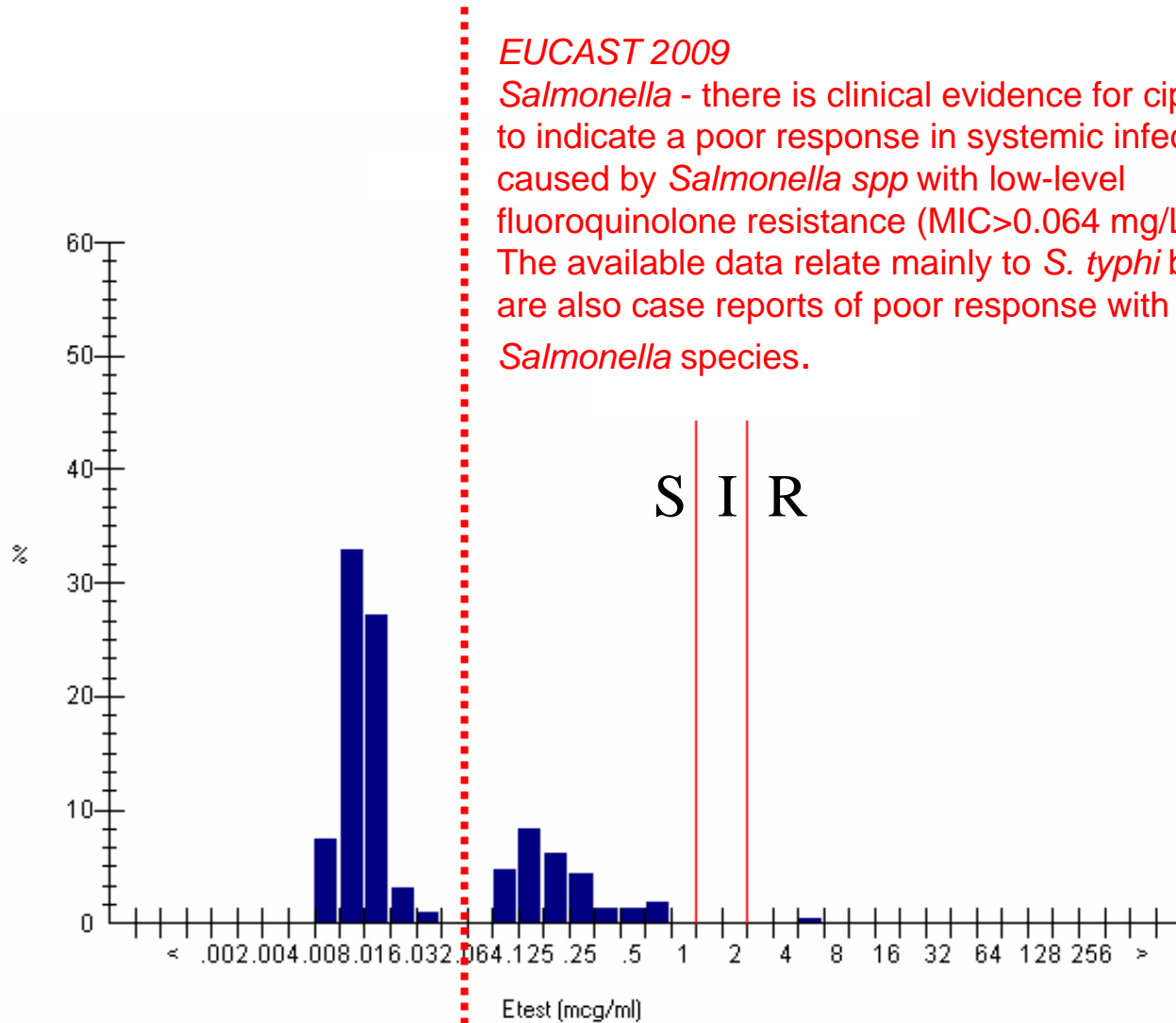
Enterobacteriaceae, urine isolates 2009 (%R)

HUSLAB material from Helsinki and Uusimaa districts. One isolate per patient (the most resistant)

	E. coli	Kl. pneum.	P. mirabilis	Other
Nitrofurantoin	2	17	99	28
Mecillinam	5	5	4	26
Cephalexin	12	7	2	54
Cefuroxime	4	2	0	28
Norfloxacin	9	2	2	3
Trimetoprim	23	21	41	17
n	22952	2649	1001	1910

Salmonella 2008 -2009, susceptibility to ciprofloxacin

HUSLAB material



EUCAST 2009

Salmonella - there is clinical evidence for ciprofloxacin to indicate a poor response in systemic infections caused by *Salmonella spp* with low-level fluoroquinolone resistance (MIC>0.064 mg/L). The available data relate mainly to *S. typhi* but there are also case reports of poor response with other *Salmonella* species.

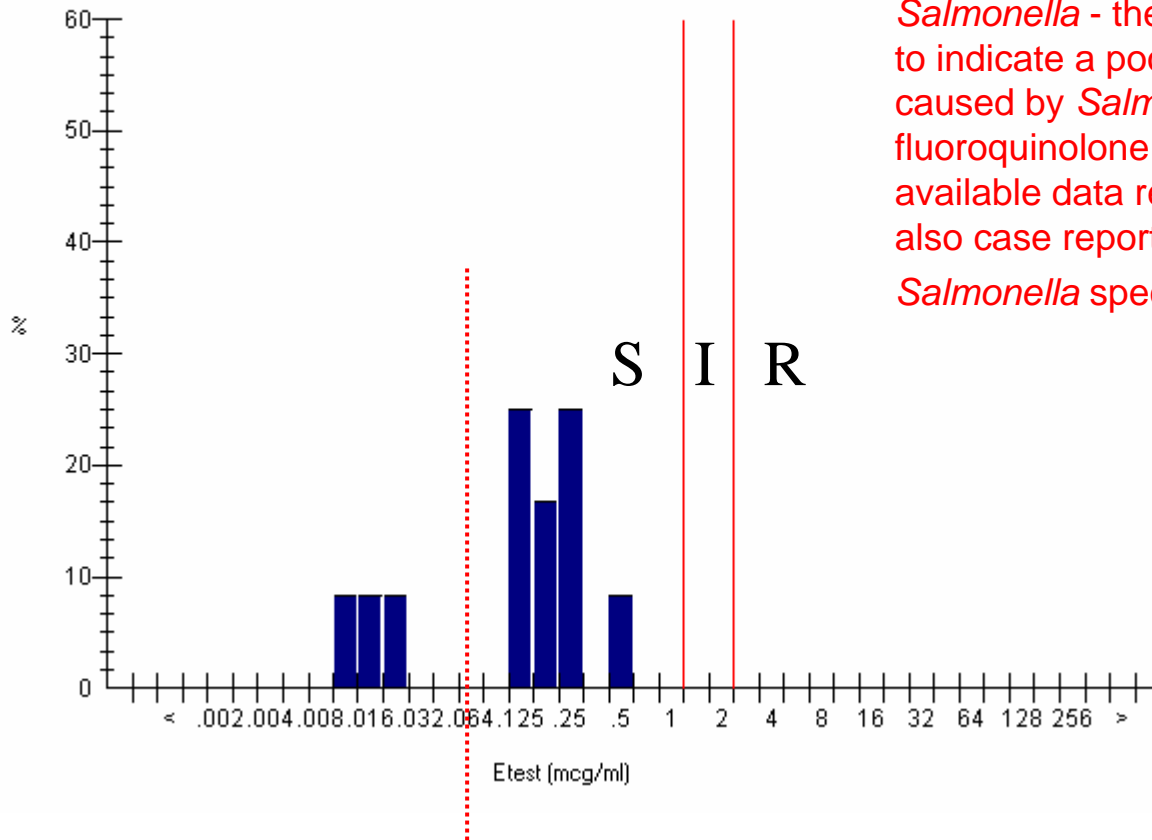
Salmonella typhi 2005 -2009, susceptibility to ciprofloxacin

HUSLAB material from Helsinki and Uusimaa Districts.

One isolate per patient (the first isolate)

$n = 12$, breakpoints according to CLSI

Ciprofloxacin



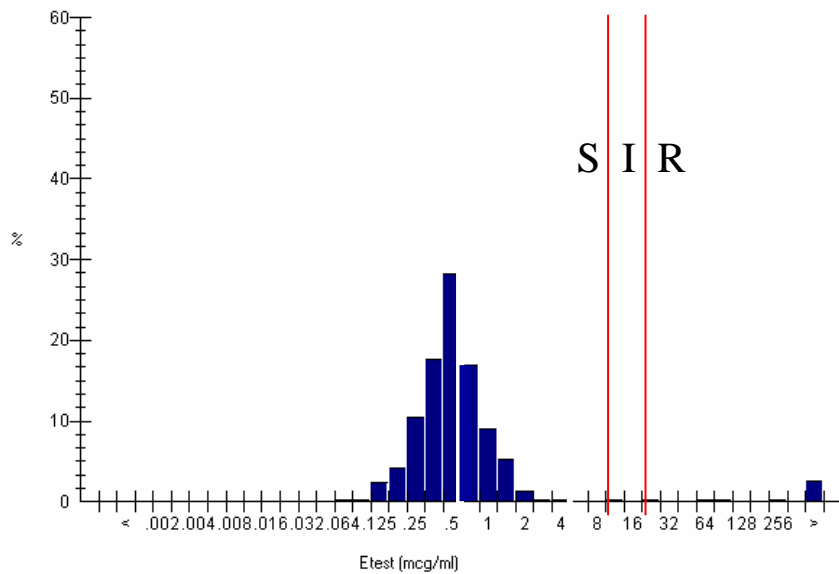
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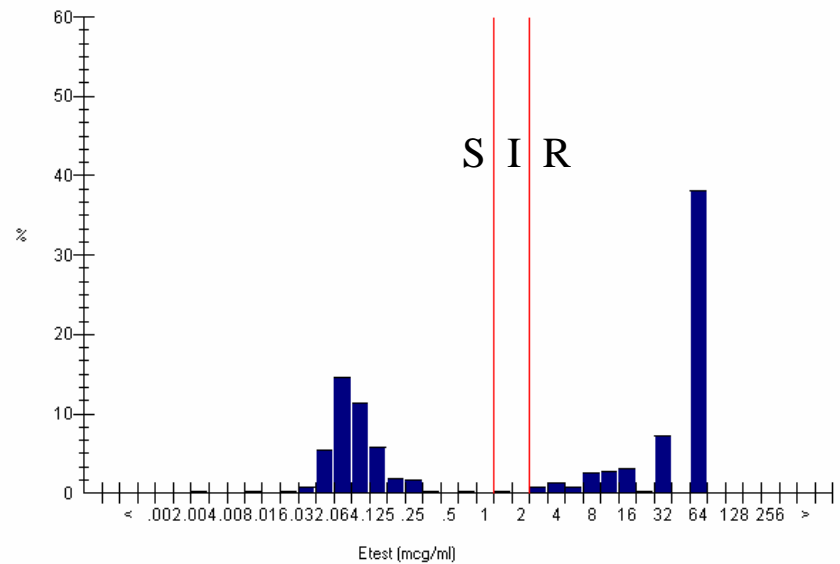
Campylobacter jejuni/coli, susceptibility to erythromycin and ciprofloxacin 2010

HUSLAB material 2009

Erythromycin



Ciprofloxacin



H. influenzae & *M. catarrhalis* 2009 (%R+I)

HUSLAB material from Helsinki and Uusimaa Districts.
One isolate per patient (the first isolate)

	H. influenzae	M. catarrh.
Ampicillin	23	100
Amoxycill-clavul.	3	0
Cefuroxime	1	0
Doxycycline	2	0
Ciprofloxacin	0	0
Sulphameth-trim.	18	2
Azithromycin	0	1
n	598	269

Neisseria gonorrhoeae 2008 - 2009 (%R+I)

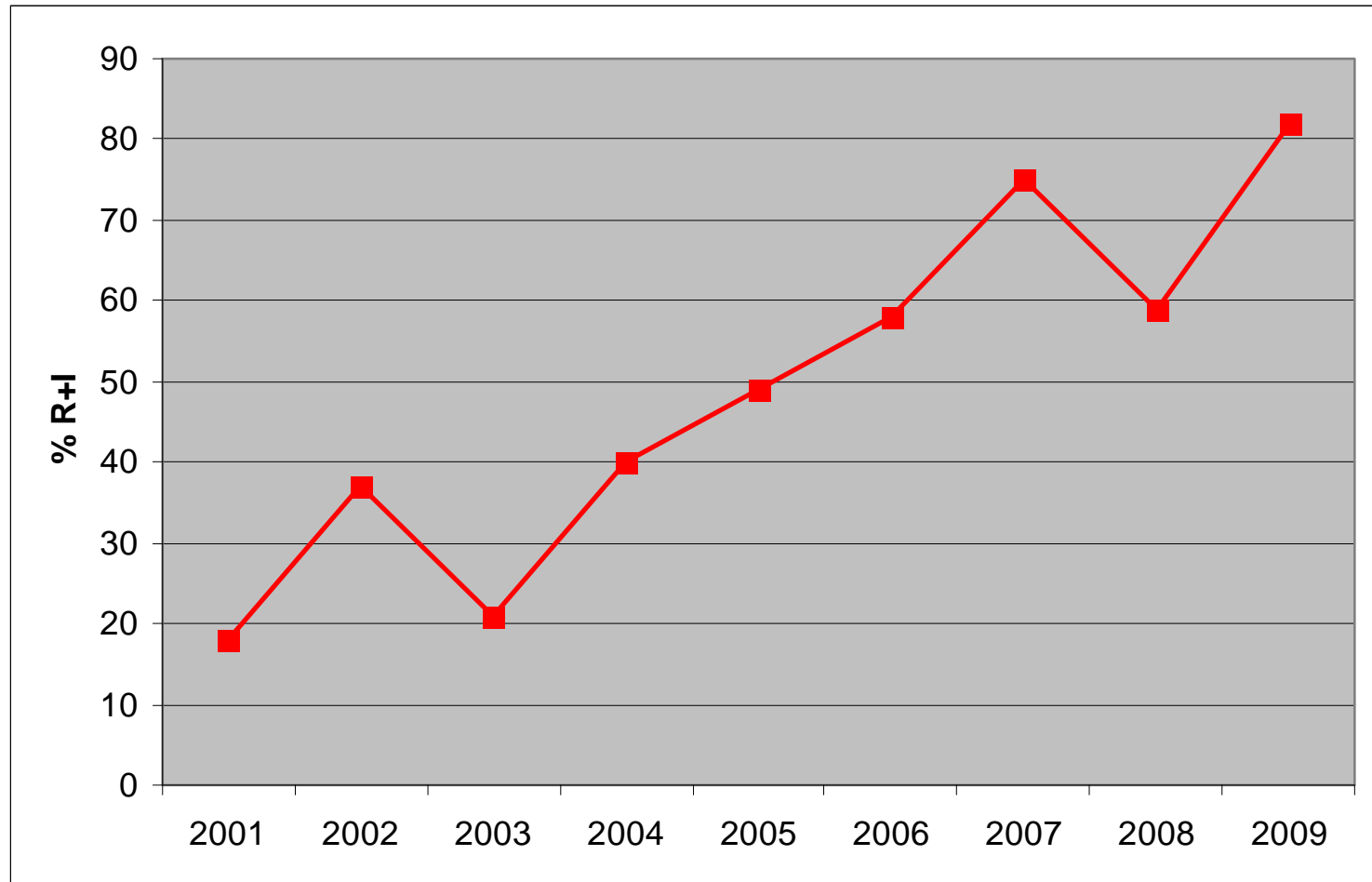
HUSLAB material from Helsinki and Uusimaa Districts.
One isolate per patient (the first isolate).

n = 127

Ciprofloxacin	72
Ceftriaxone	0
Azithromycin	1

Neisseria gonorrhoeae, resistance to ciprofloxacin 2001-2009

HUSLAB material from Helsinki and Uusimaa Districts



Neisseria meningitidis 2008- 2009 (%R+I)

HUSLAB material from Helsinki and Uusimaa Districts.
One isolate per patient (the first isolate)

Penicillin-I	0
Penicillin-R	0
Cephtriaxone	0
Meropenem	0
Ciprofloxacin	0
Chloramphenicol	0
n	39

Bacteroides fragilis group 2009 (%R+I)

HUSLAB material from Helsinki and Uusimaa Districts.
One isolate per patient (the first isolate)

n = 1055

Metronidazole	0
Piperacillin-tazobactam	1
Imipenem	0
Clindamycin	59
Doxycycline	9
Penicillin G	100

Prevotella spp. 2009 (%R+I)

HUSLAB material from Helsinki and Uusimaa Districts.
One isolate per patient (the first isolate)

n = 471

Metronidazole	0
Piperacillin-tazobactam	0
Clindamycin	20
Doxycyclin	15
Penicillin G	63

Porphyromonas gingivalis 2009 (% I+R)

HUSLAB material from Helsinki and Uusimaa Districts.
One isolate per patient (the first isolate)

n = 41

Penicillin	0
Amoxicillin-clavul	0
Doxycyclin	0
Metronidazole	0
Clindamycin	0
Azithromycin	0