

HUSRES Annual Report 2007
Martti Vaara



www.huslab.fi

www.intra.hus.fi



Martti Vaara, 3/2008

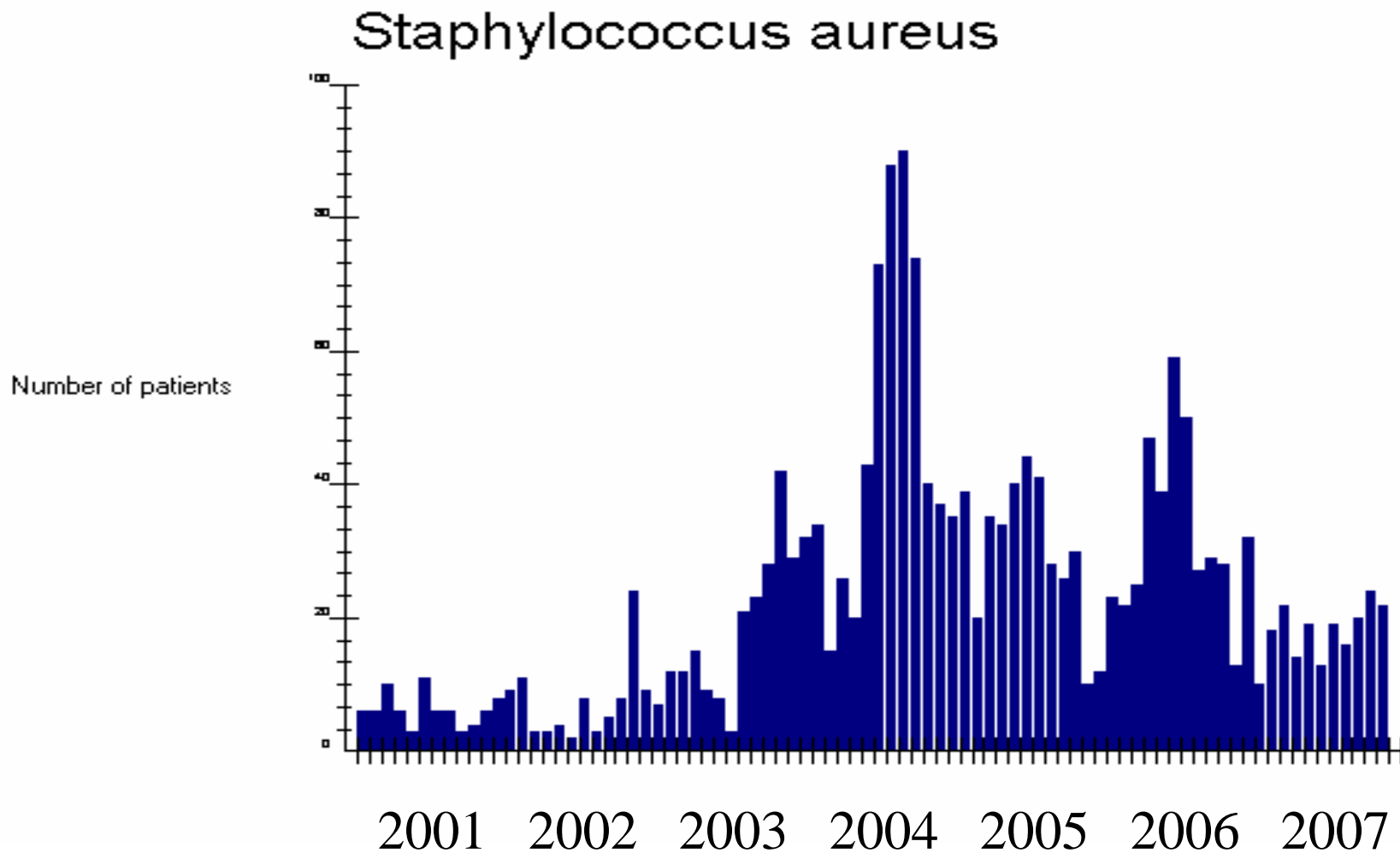
The basis of this HUSRES 2007 report is the HUSLAB/Whonet database 2007, which contains susceptibility data on about 182.000 bacteria isolated and studied in 2007 by HUSLAB.

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

HUSRES 2007 report contains data on thirty clinically most important bacterial species/groups.

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

MRSA, new cases incl. carriers monthly 2001 – 2007 in Huslab material (Helsinki and Uusimaa District)



Martti Vaara, 3/2008

Staph. aureus 2007 (%R+I)

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

Material	n	Oxa	Ery	Cli	Lev	Rif	Fus	Tob	Net	Lnz	SxT
HUCH (7 hosp)	1861	6	8	7	6	1	5	5	0	0	2
Blood isolates	321	2	5	4	3	1	3	2	0	0	2
Jorvi Hosp	488	3	7	6	4	0	5	3	0	0	0
Peijas Hosp	265	9	7	6	6	1	4	9	0	0	0
Outpatients	2542	5	7	6	5						
All sources	7708	5	7	6	5						

Staph. epidermidis 2007 (%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.	713	87	70	64	70	25	59	57	14	0	50
Childrens´ hosp	168	83	65	57	31	10	73	61	13	0	55
All sources	2553	75	61	52	50	18	58	45	11	0	45

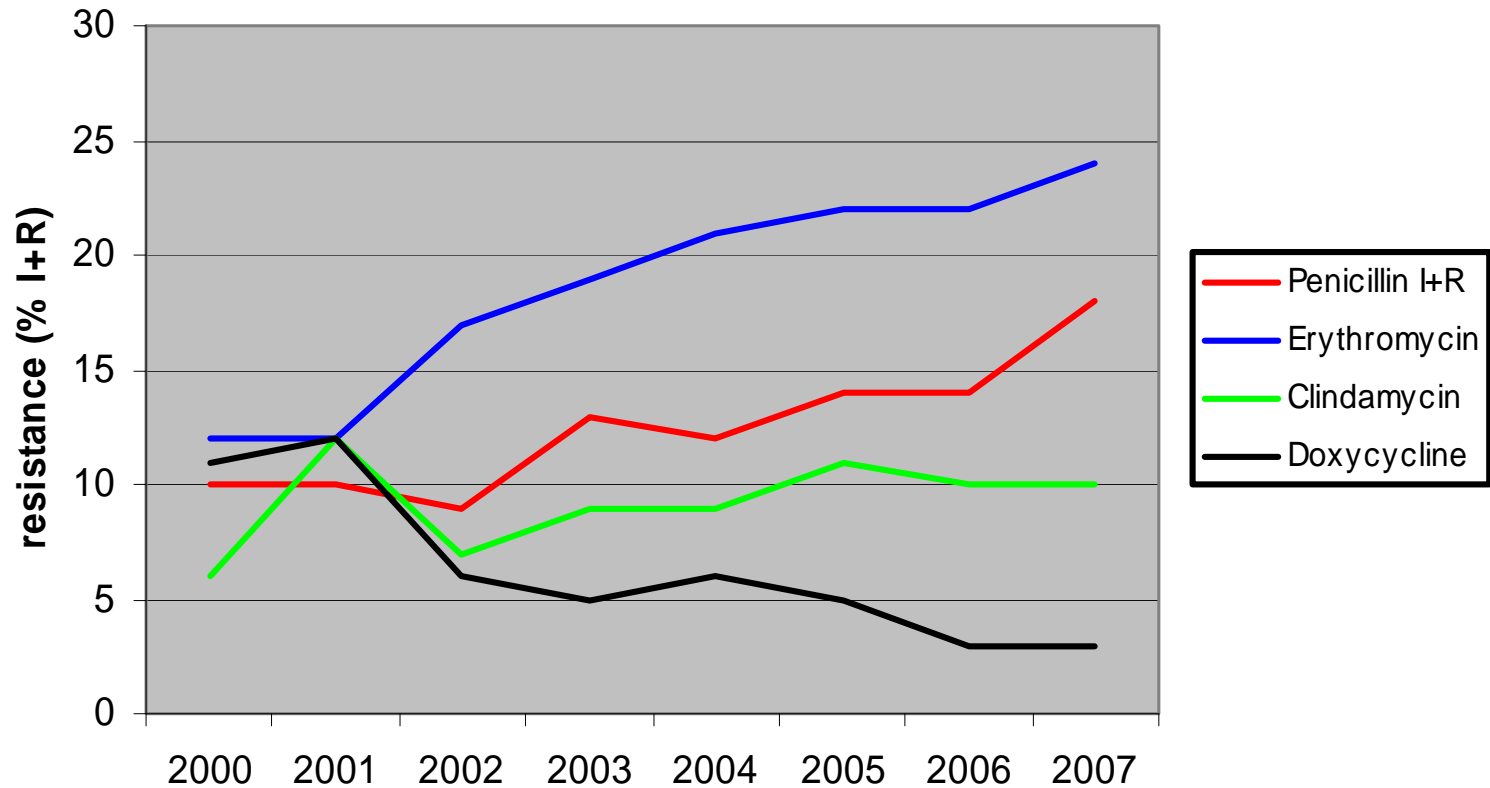
Streptococcus pneumoniae 2007 (%R+I)

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

	All	Blood	ENT	Age ≤15 y	Age ≥65 y
Penicillin - R	4,1	1,5	4,5	5,1	1,7
Penicillin - I	14	12,9	13,5	15,1	12,8
Ceftriaxone - R	0,1	0	0,5	0,2	0
Ceftriaxone - I	0,3	0	1,3	0	0
Erythromycin	24	28	23	28	28
Clindamycin	10	7	12	12	9
Doxycycline	3		2	3	2
Sulphamet-Trim.	25		24	26	29
Levofloxacin		0			
Moxifloxacin		0			
Telithromycin		0			
<i>n</i>	959	202	223	449	117

Str. pneumoniae, resistance 2000 - 2007

Huslab material



Martti Vaara, 3/2008

Multiresistance among *Str. pneumoniae* 2007, multiresistance profiles displayed by ≥ 15 isolates

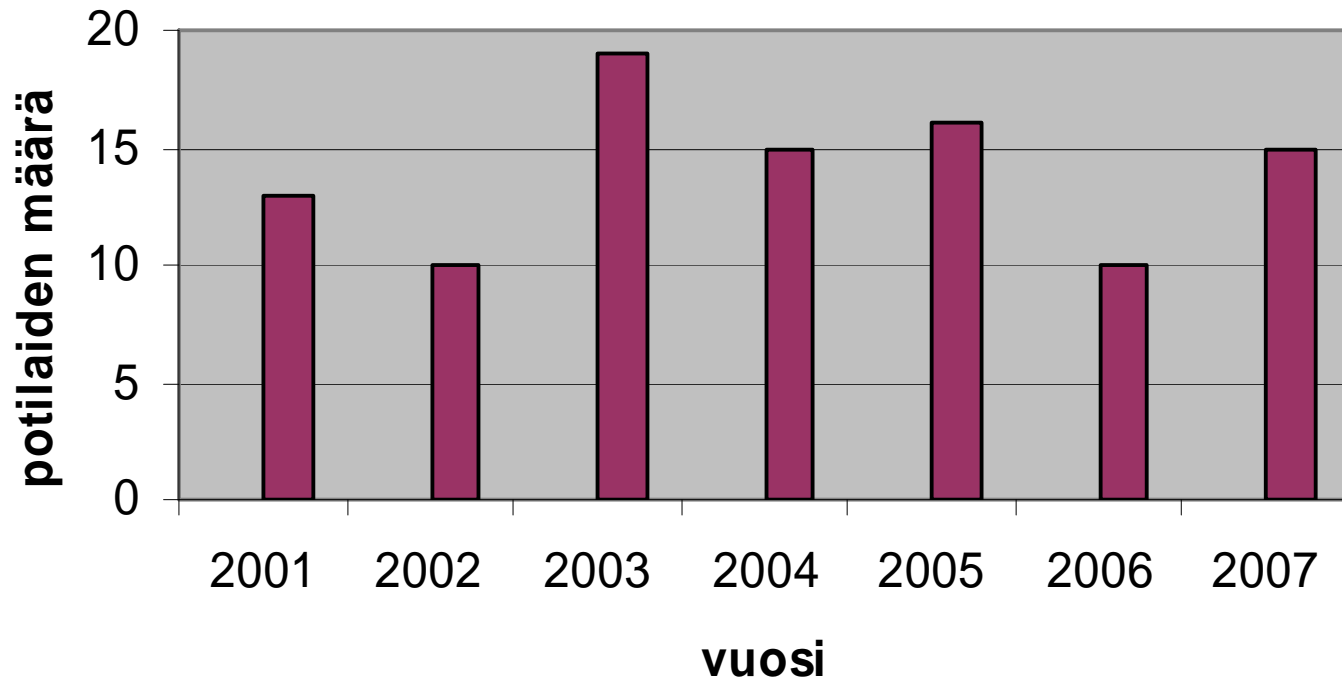
HUSLAB material from Helsinki and Uusimaa districts. One isolate per patient (the first isolate)

					% freq	n of isolates with this pattern
Pen	Ery	Cli	SxT	Dox	1,5	19
Pen	Ery	Cli	SxT		4,6	56
Pen	Ery		SxT		4	49

Total number of isolates studied: 1229

**Multiresistance defined here as non-susceptibility
(= R+I) to \geq three antibacterial agents**

**Very multiresistant pneumococci
(PenR/I, Ery, Cli, SxT, Dox)
HUSLAB material 2001-2007**



Martti Vaara, 3/2008

Beta-hemolytic streptococci 2007 (%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	1,5	11	11
Clindamycin	1	10	9
n	7675	3696	3072

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

Streptococcus viridans group, blood isolates 2007

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

Penicillin -I	15
Penicillin -R	0
Ceftriaxone -I	0
Ceftriaxone -R	0
Erythromycin I+R	19
Clindamycin	6
Gentamycin -high res.	0
Vancomycin	0

n = 148

Str. anginosus [milleri] group 2007 (%R+I)

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

n = 639

Penicillin	0
Cephalospor. I gen.	0
Erythromycin	8
Clindamycin	7
Vancomycin	0

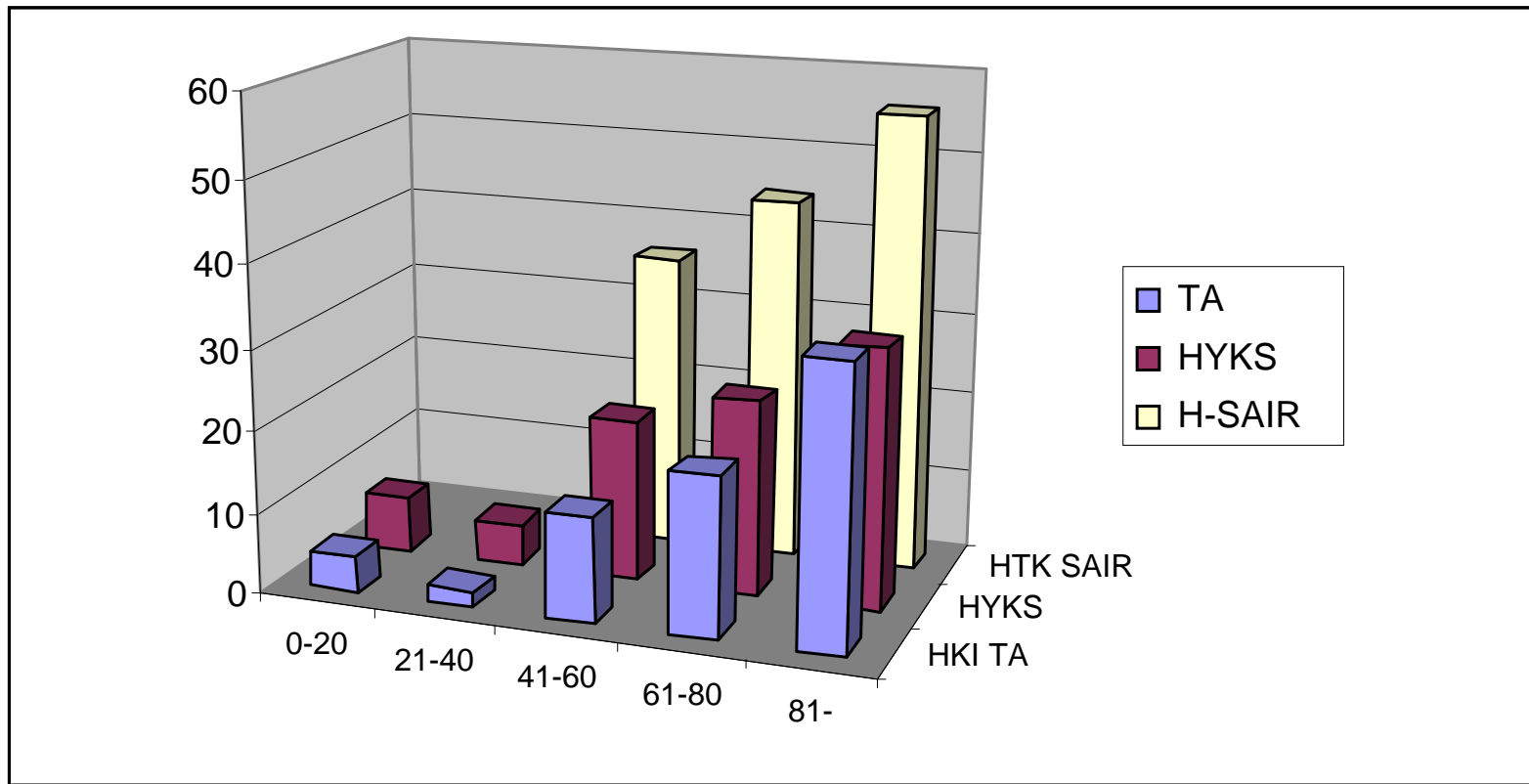
Enterococci 2007

%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	92	95	99
Imipenem	0	0		91	95	
Linezolid-I	0	2		0	0	
Linezolid-R	0.1	0		0	0	
Vancomycin	0.1	0	0	1,2	3	0
Gentam. (hi)		20			27	
Levofloxacin		33			94	
Norfloxacin			28			96
Nitrofurantoin			0,5			76
SuTri			18			87
<i>n</i>	1664	98	4579	641	64	1128

**Enterococcus faecalis, urine isolates from female patients,
resistance (% R) to norfloxacin by age categories in 2005-2007,
HUSLAB material (n = 6274)**

**Outpatients at Helsinki Health Center (TA), inpatients at Helsinki City Hospitals (H-SAIR),
patients at Helsinki University Hospital (HYKS)**



Pseudomonas aeruginosa 2007 (%R+I)

Pus isolates (panel A) and blood isolates (panel B). 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	253	8	16	12	15	6	25
Töölö	145	7	17	8	9	6	39
Helsinki City hospitals	156	5	8	9	8	3	30
Maria	50	0	2	0	4	4	16
Jorvi Hospital	113	3	9	13	6	0	24
Peijas Hospital	46	7	7	9	2	0	24
Childrens´	43	2	5	2	0	0	5
Uusimaa regional hospitals	178	5	8	7	8	4	26
Outpat. in Health Cntrs	560	2	4	5	5	1	16

Ps. aeruginosa in Meilahti hospital, frequency of isolates resistant to \geq four of the six commonly available agents ^{a)}

a) Ctaz, Mero, Pi-Tz, Cip, Tob, Ami, Resistance defined here as nonsusceptibility (= R+I), Huslab material. One isolate per patient

Frequency (%) of isolates resistant to	2003	2004	2005	2006	2007
all six (= panresistant)	3.0	1	0,4	0	0,7
five	4,2	3,4	1,9	0,8	1
four	11,1	6,5	5,7	2,4	1,9
total number of isolates studied	334	294	265	376	419

Pseudomonas aeruginosa 2007 (%R+I), urine isolates

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

Material from	n	Ctaz	Mero	Pi-Tz	Tob	Cip
Meilahti	181	4	6	6	7	23
Töölö	30	0	0	3	3	27
Helsinki City hospitals	283	4	8	6	8	21
Maria	164	1	3	4	7	21
Childrens´	45	0	2	0	0	2
Outpat. in Health Cntrs	637	2	4	5	7	19

Acinetobacter spp. 2007 (%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	Cip	SuTri
Meilahti	64	12	9	11	11	14	16
Töölö	73	18	8	10	19	14	12
Other sources	108	8	6	9	3	5	7

Acinetobacter spp. in Töölö hospital 2002 - 2007

Resistance (%R+I)

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

	n	Ctaz	Mero	Pi-Tz	Tob	Cip	SuTri
2002	130	25	15	26	21	23	27
2003	112	17	10	20	14	13	17
2004	101	12	2	8	13	13	16
2005	153	33	25	29	33	35	33
2006	90	21	16	17	18	17	23
2007	73	18	8	10	19	14	12

Acinetobacter in Töölö hospital, frequency of isolates resistant (R+I) to \geq four of the seven commonly available agents ^{a)}

a) Ctaz, Mero, Pi-Tz, Cip, Tob, Ami, SuTri
HUSLAB material. One isolate per patient

Frequency (%) of isolates resistant to	2004	2005	2006	2007
all seven (= panresistant)	1	19	7	8
six	1	0	0	1
five	5	5	3	1
four	2	4	1	1
total number of isolates studied	101	153	92	77

Stenotrophomonas maltophilia 2007 (%R+I)

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

HUSLAB material from hospitals in Helsinki and Uusimaa Districts.

Hospital	<i>n</i>	SxT	Levo	Tic-clav
Meilahti	104	9	33	57
Töölö	52	4	21	44
Childrens´	21	10	10	53
Other sources	348	5	14	45

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

Enterobacteriaceae 2007 (%R+I)

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

	n	Cfur	Ctax	Pi-Tz	Tob	Levo	Mero
E. coli	1039	11	8,0	8*	9	14	0
Kl. pneumoniae	244	10	3	3*	3	3	0,4
Kl. oxytoca	137	14	2	2*	0	1	0
Proteus mirabilis	97	1	0	0	0	1	0
Ent. cloacae	314	47	31	31**	3	3	1
Enterobact. spp.	42	44	31	31**	2	2	2
Citrob. spp.	101	31	22	22**	1	5	0
Serratia marc.	143	94	7	7**	6	4	0
Proteus vulgaris	52	92	2	2**	0	0	0
Morganella morg	60	85	10	10**	5	5	0
Total	2693	26	11	11	6	8	0,1
(Total 2006)	2303	24	10	10	5	8	0
(Total 2005)	2312	25	10	10	5	8	0,2

*: all ESBL strains reported here as nonsusceptible

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

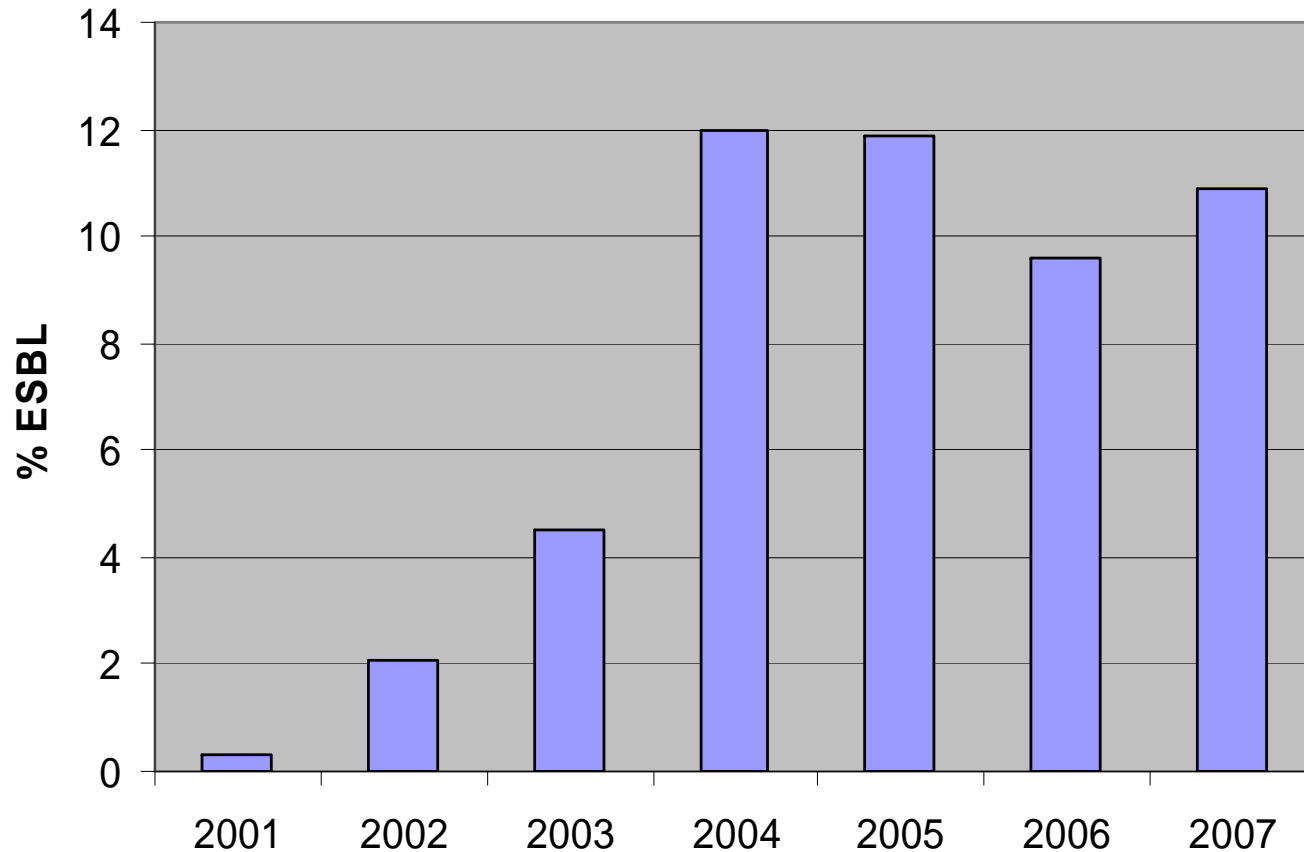
Martti Vaara, 3/2008

ESBL 2007 (% frequency) at different locations

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

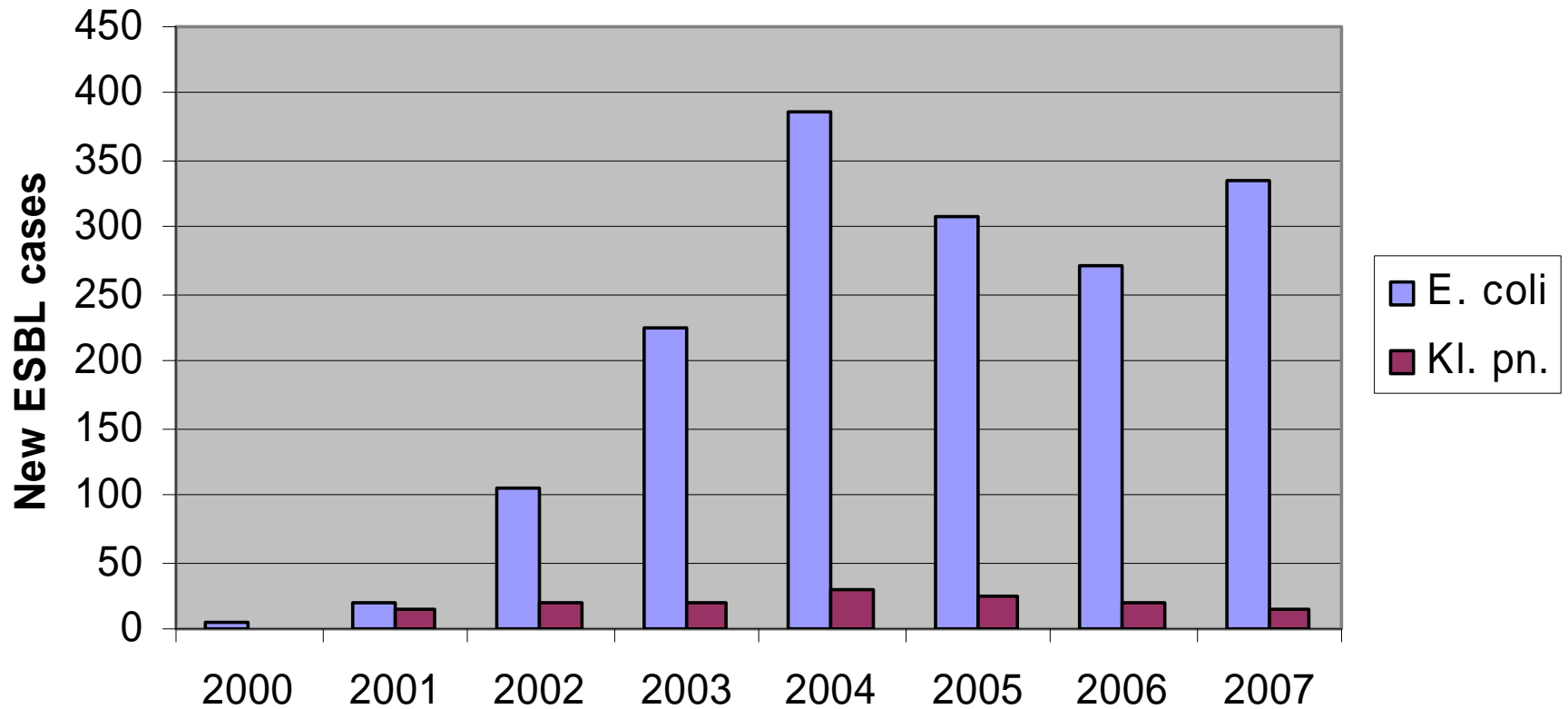
Material	E. coli		K. pneumoniae	
	pus & blood	urine	pus & blood	urine
HUCH (7 hospitals)	8	3	3	2
Helsinki City hospitals	25	9	5	3
Helsinki City outpatients	18	3	5	1
Uusimaa regional hospitals	6		5	
Jorvi Hospital	6	3	2	1
Peijas Hospital	11	2	0	1
All sources	9	3	3	2

Frequency of *E. coli* ESBL in Helsinki City Hospitals 2001 - 2007



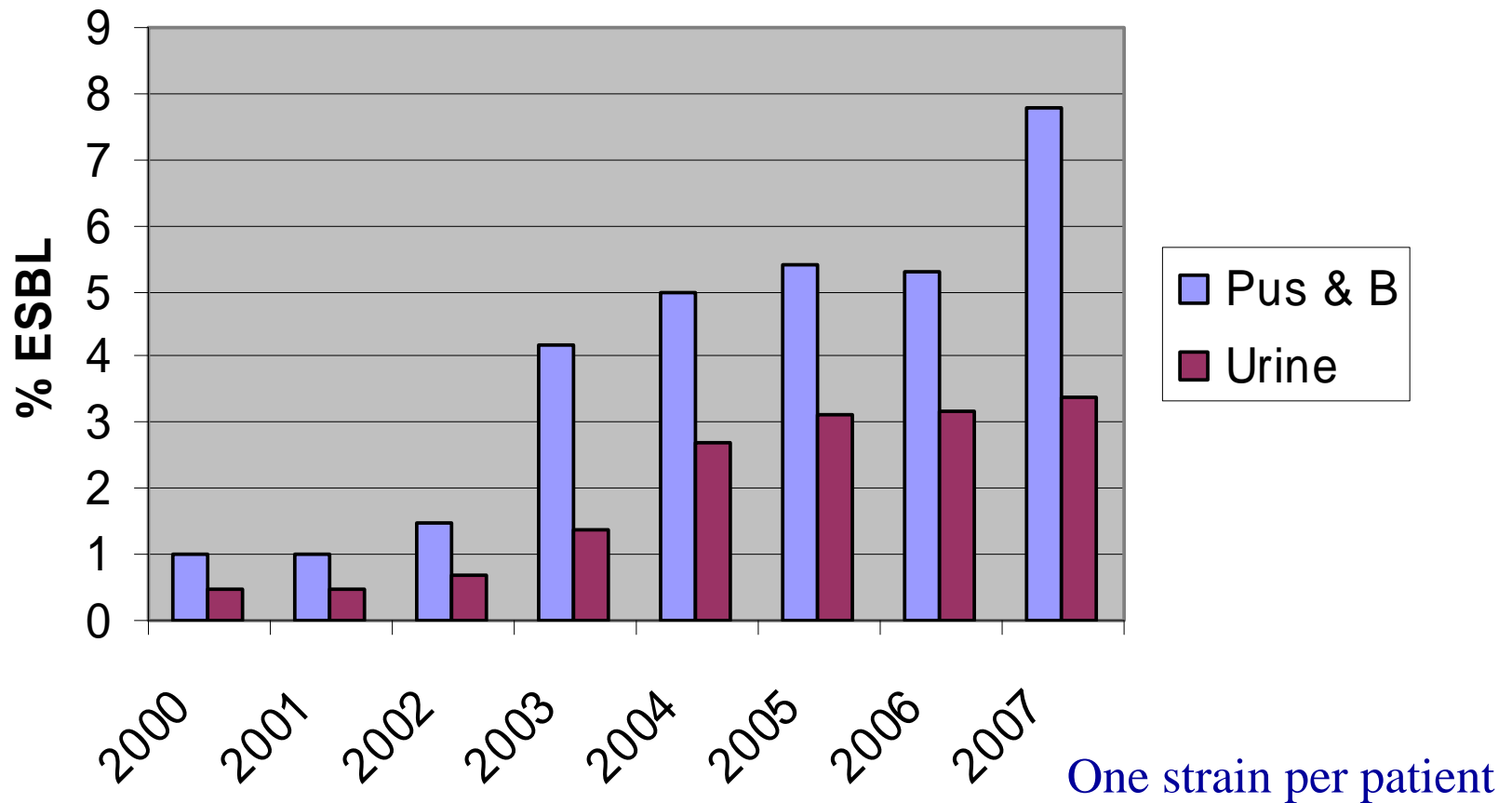
Martti Vaara, 3/2008

The yearly number of new ESBL cases in Helsinki Health Center



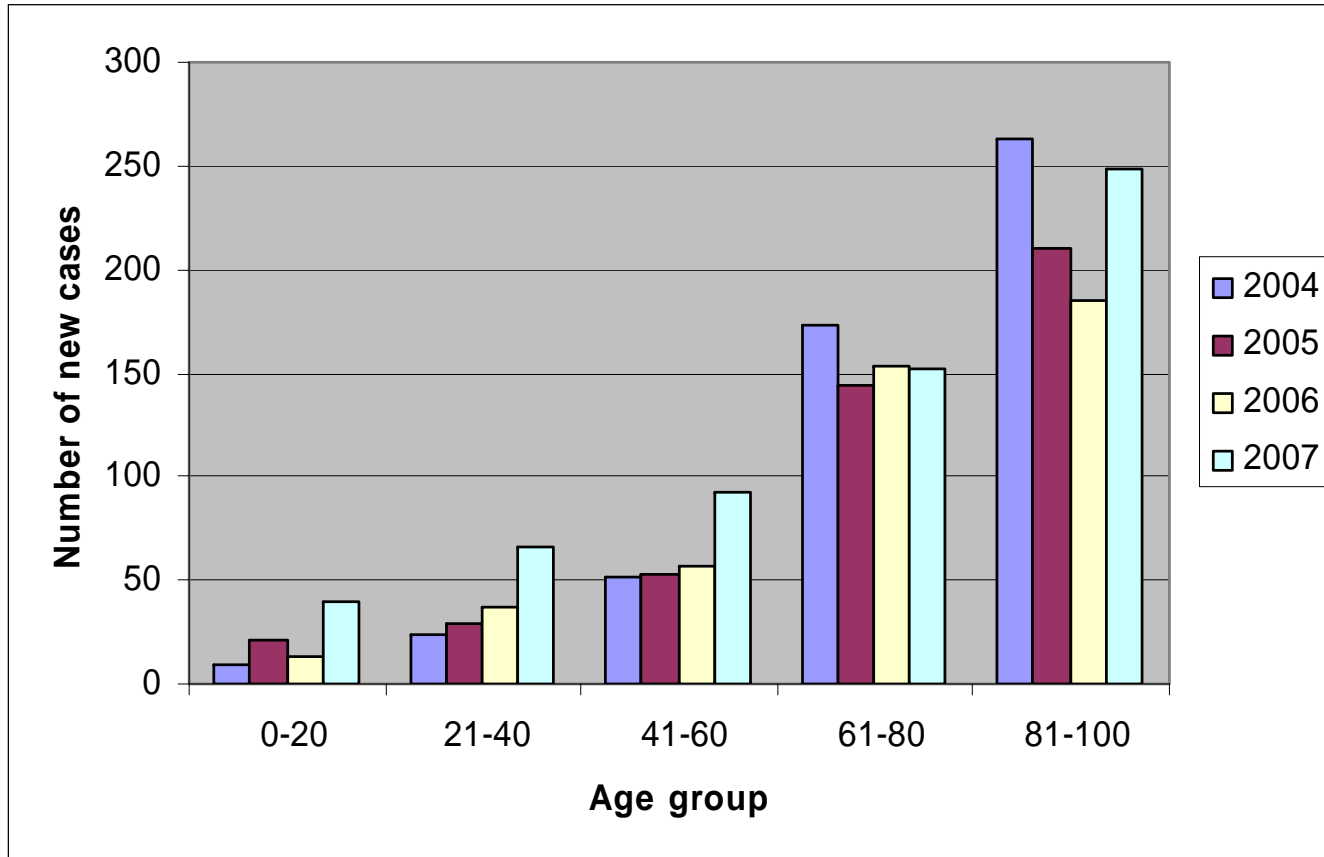
Martti Vaara, 3/2008

Frequency of E. coli ESBL at Helsinki University Hospitals in Helsinki 2000 - 2007

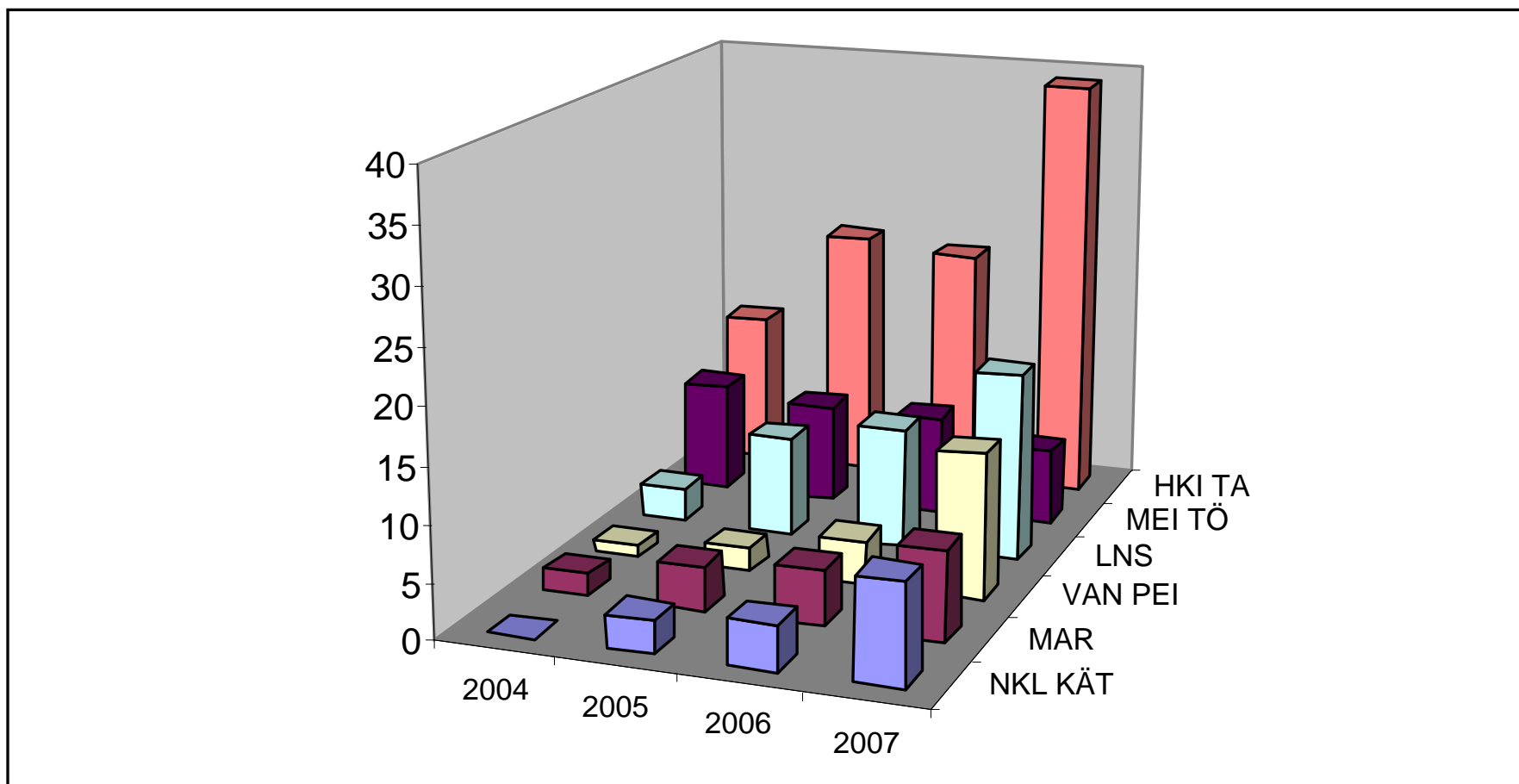


Martti Vaara, 3/2008

E. coli ESBL in Huslab material 2004 – 2007, Number of new cases by age categories



New E. coli ESBL cases in patients aged 1-40 years in 2004 – 2007 at six locations

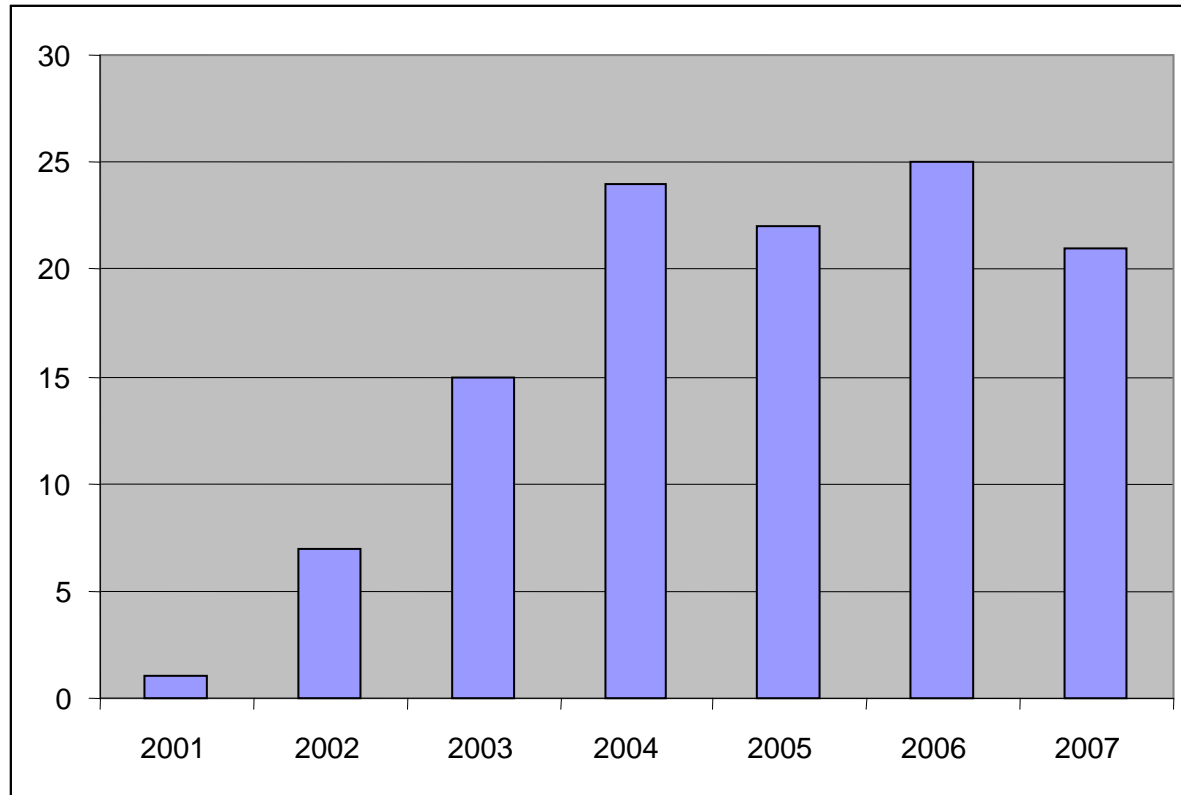


HKI TA, Helsinki City Health Center; MEI TÖ, Meilahti % Töölö Hospitals; LNS, Childrens´ Hosptital, VAN PEI, Vantaa Health Center and Peijas Hospital; MAR, Maria Hospital; NKL KÄT, Div. Obstetrics & Gynaecol, Helsinki Univ Hospital.

Martti Vaara, 3/2008

Bacteremias by E. coli ESBL, HUSLAB material 2001-2007

Number of patients per year



Martti Vaara, 3/2008

E. coli ESBL strains, resistance to non-betalactams and meropenem 2006 - 2007

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

Antibiotic	blood	pus	Urine	Urine pt age \leq 50 years
Ciprofloxacin	87	83	85	61
Levofloxacin	87	83		
Norfloxacin			86	66
Tobramycin	67	69	67	55
Sulphatrimetoprim	52	46	39	66
Trimetoprim			45	68
Nitrofurantoin			10	9
Meropenem	0	0	0	0
<i>n</i>	46	310	1012	170

K. pneumoniae ESBL strains, resistance to non-betalactams and carbapenems 2006 - 2007

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

Antibiotic	Pus & Blood	Urine
Ciprofloxacin	79	72
Levofloxacin	79	
Norfloxacin		72
Tobramycin	85	77
Sulphatrimetoprim	63	78
Trimetoprim		82
Nitrofurantoin		75
Meropenem	3	0
Imipenem		
Ertapenem		
<i>n</i>	27	60

K. pneumoniae ESBL strains, resistance to non-betalactams and meropenem 2006 - 2007

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

Antibiotic	Pus & Blood	Urine
Ciprofloxacin	79	67
Levofloxacin	79	
Norfloxacin		70
Tobramycin	85	71
Sulphatrimetoprim	63	79
Trimetoprim		82
Nitrofurantoin		73
Meropenem	3	3
Imipenem	0	0
Ertapenem	6	15
<i>n</i>	33	62

Martti Vaara, 3/2008

E. coli, urine isolates from female patients, antibiotic susceptibility by age groups 2006-2007

HUSLAB material from

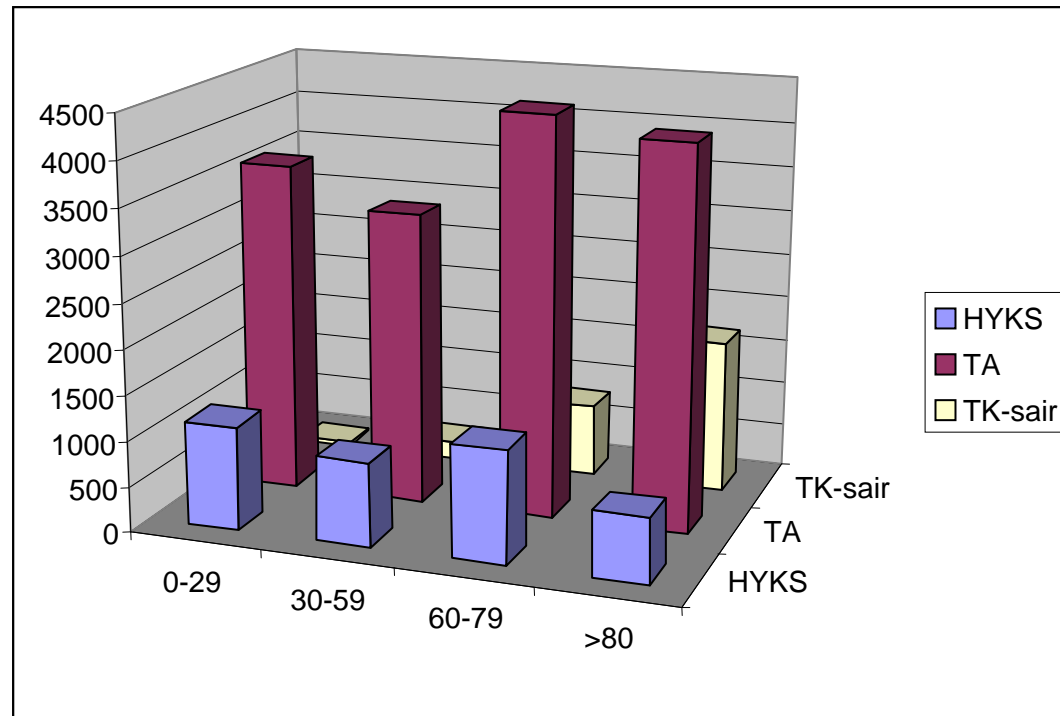
**outpatients at Helsinki Health Center (TA),
inpatients at the Helsinki City hospitals (TK-SAIR), and
patients at Helsinki University Hospital (HYKS)**

a) Marian sairaala poislukien

Martti Vaara, 3/2008

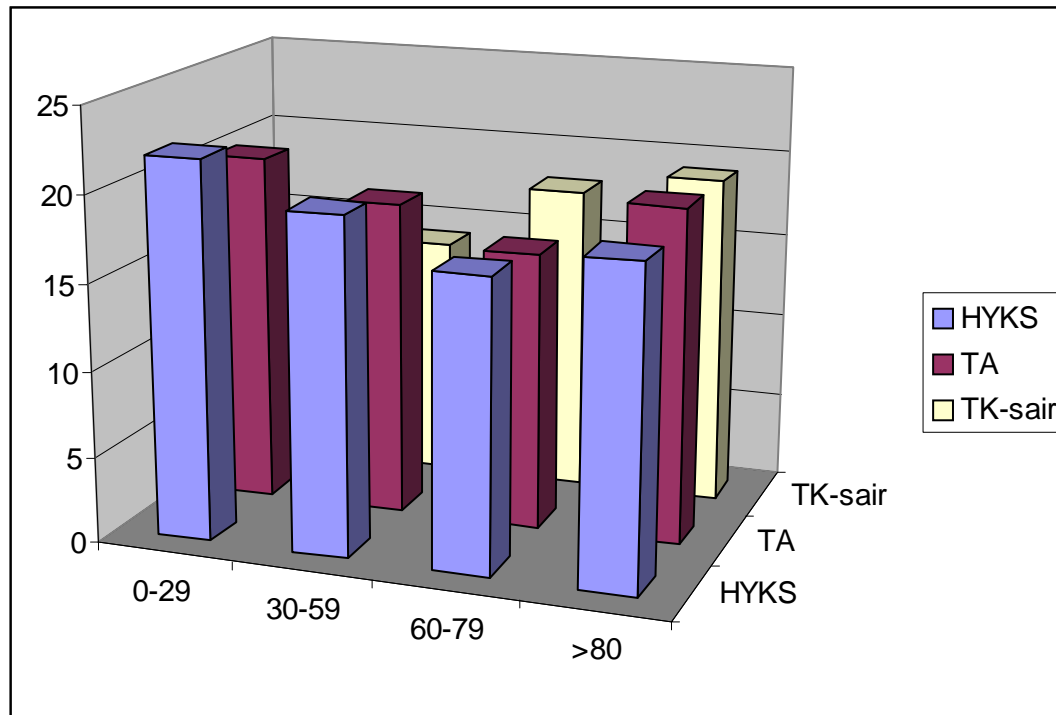
E. coli, urine isolates from female patients, antibiotic susceptibility by age groups 2006-2007

Distribution of the strains (total n = 22214)



E. coli, urine isolates from female patients, antibiotic susceptibility by age groups 2006-2007

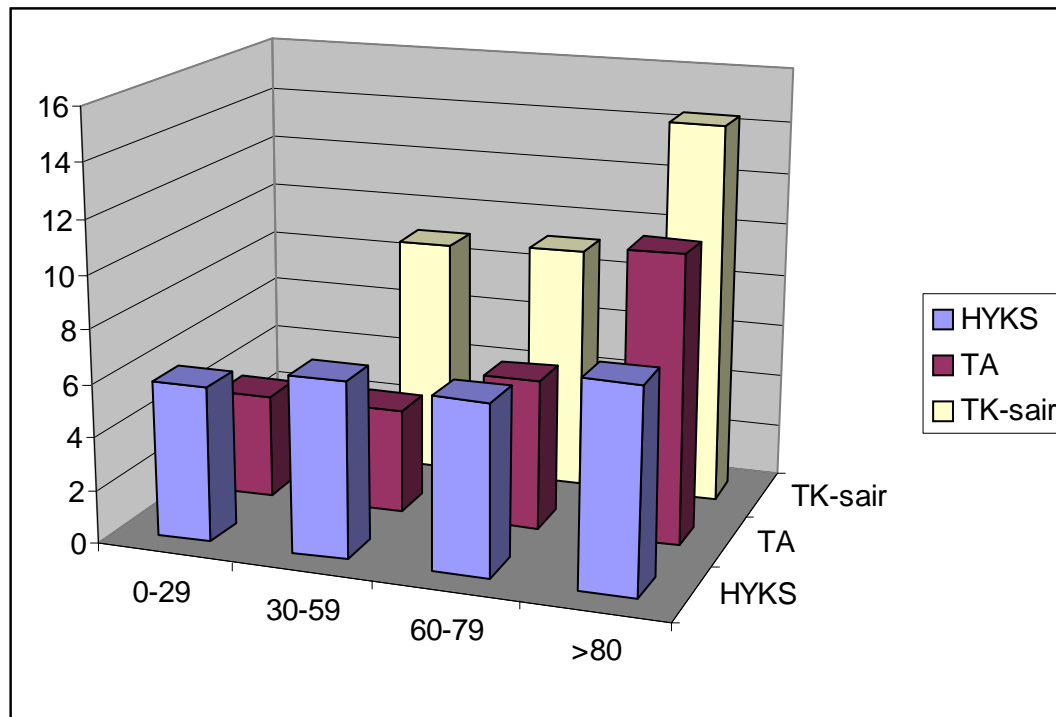
Trimetoprim (%)



Martti Vaara, 3/2008

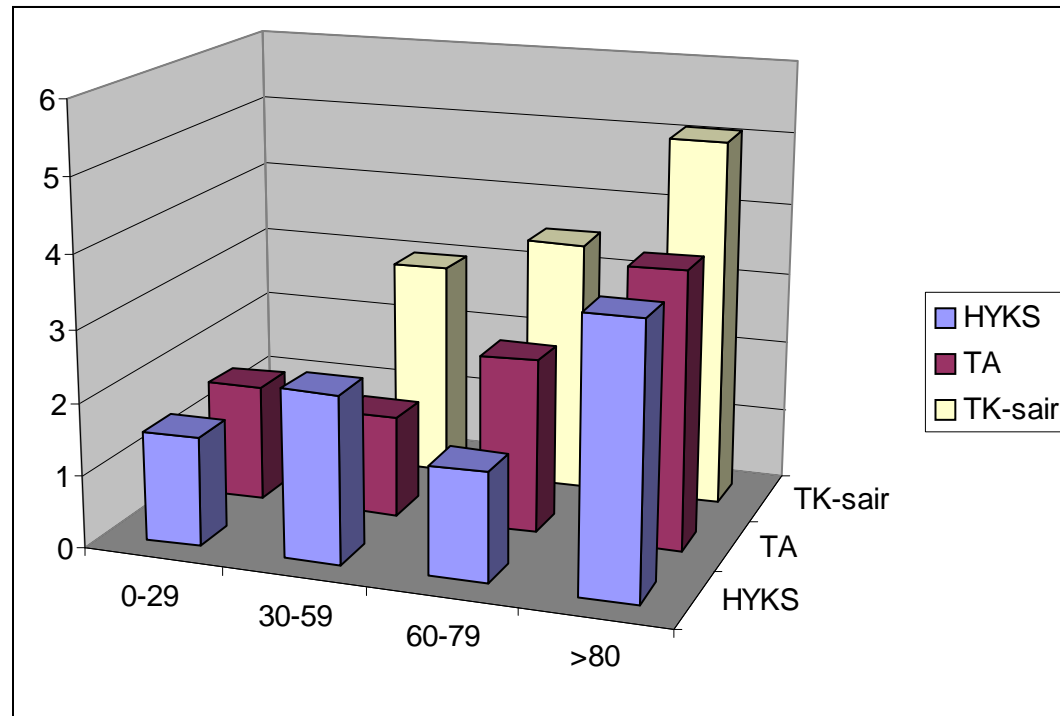
E. coli, urine isolates from female patients, antibiotic susceptibility by age groups 2006-2007

Cephalexin (% R)



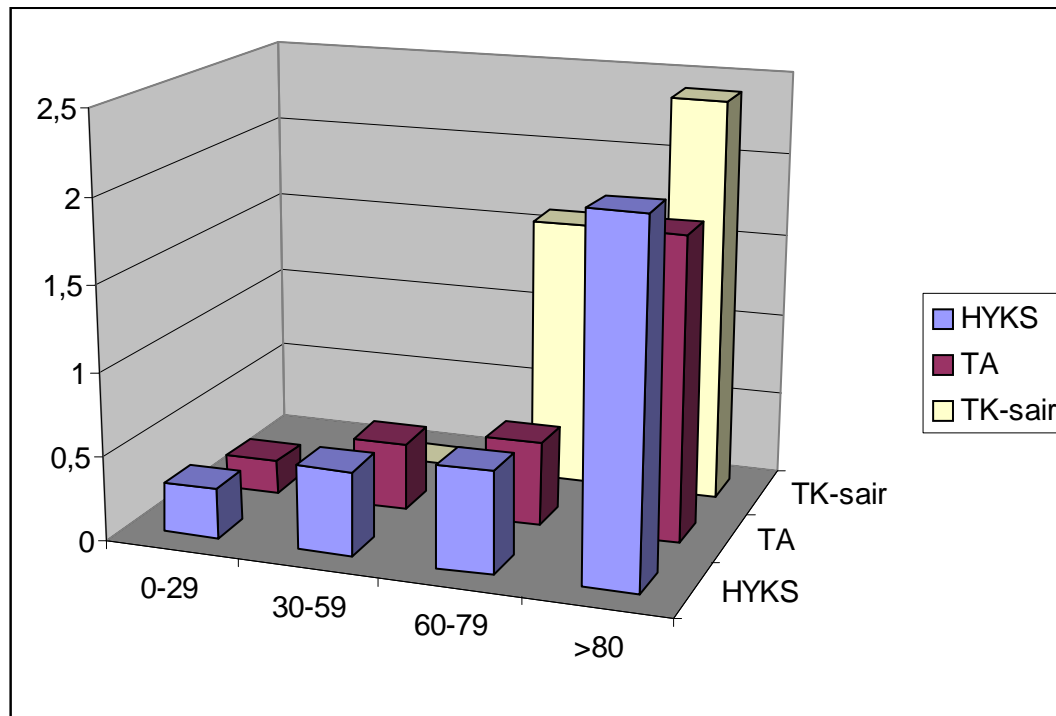
E. coli, urine isolates from female patients, antibiotic susceptibility by age groups 2006-2007

Mecillinam (% R)



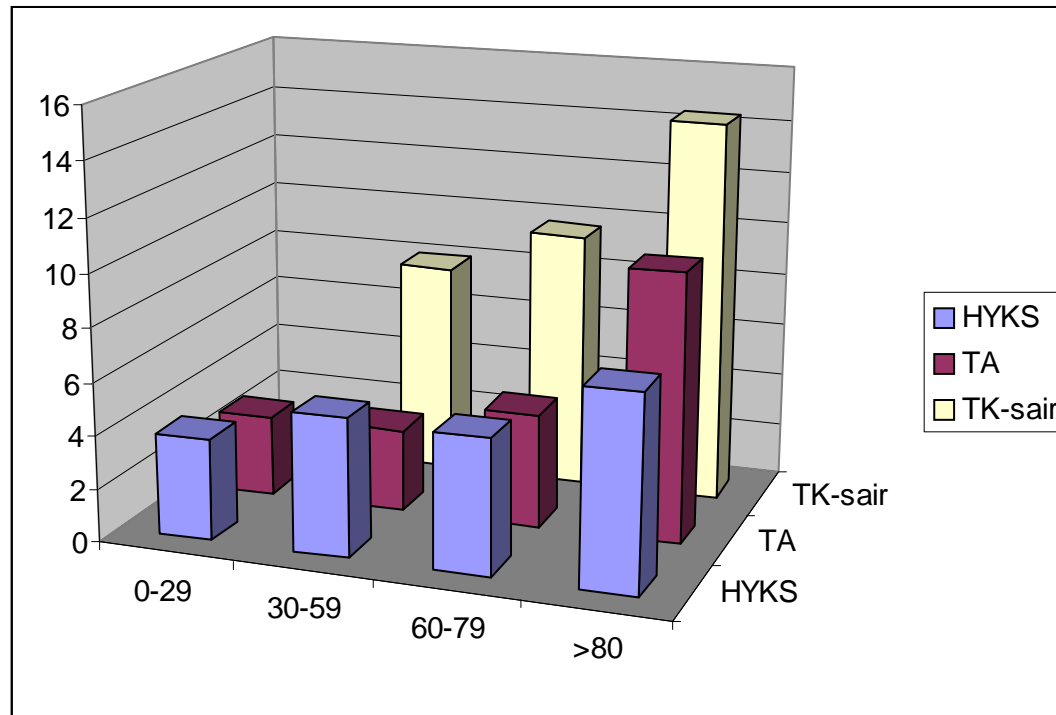
E. coli, urine isolates from female patients, antibiotic susceptibility by age groups 2006-2007

Nitrofurantoin (% R)



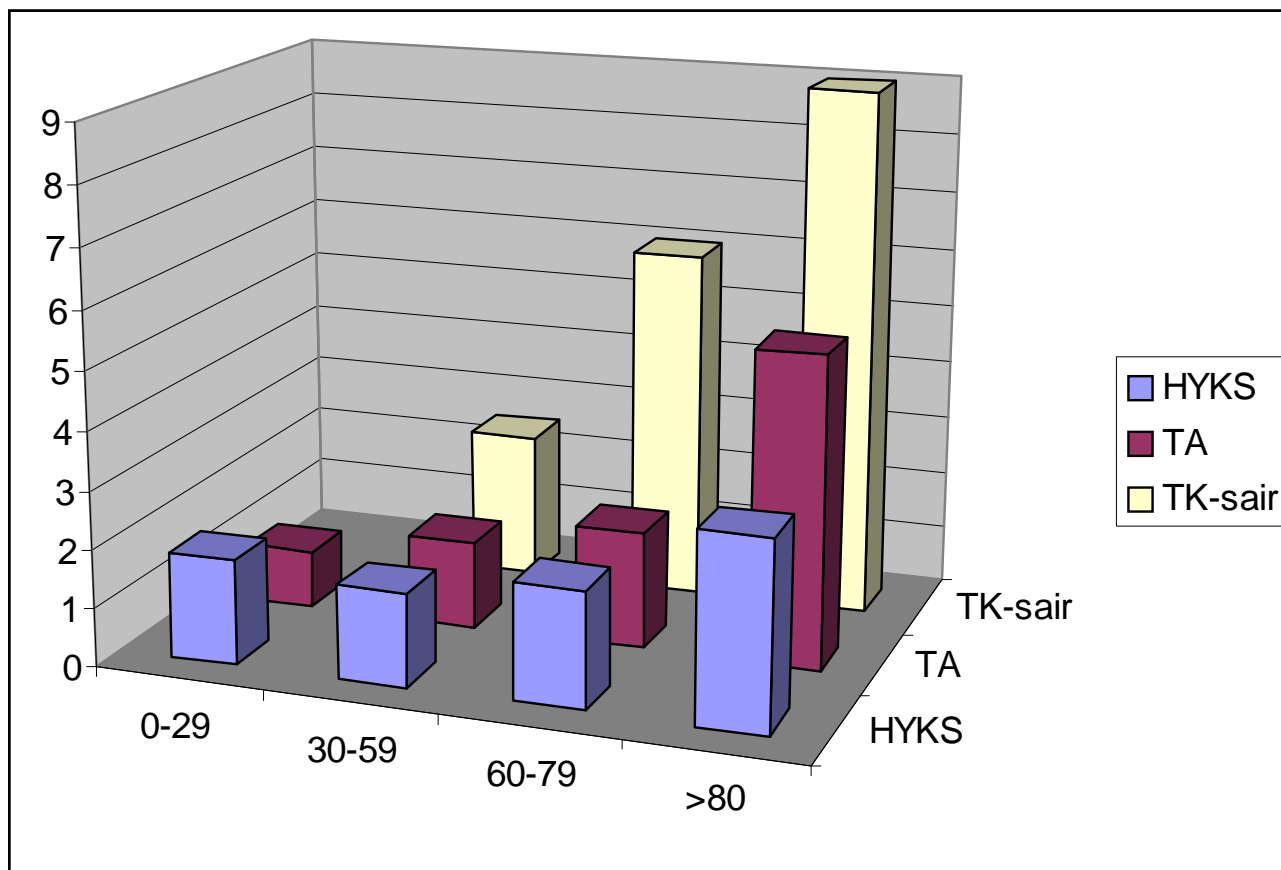
E. coli, urine isolates from female patients, antibiotic susceptibility by age groups 2006-2007

Norfloxacin (% R)

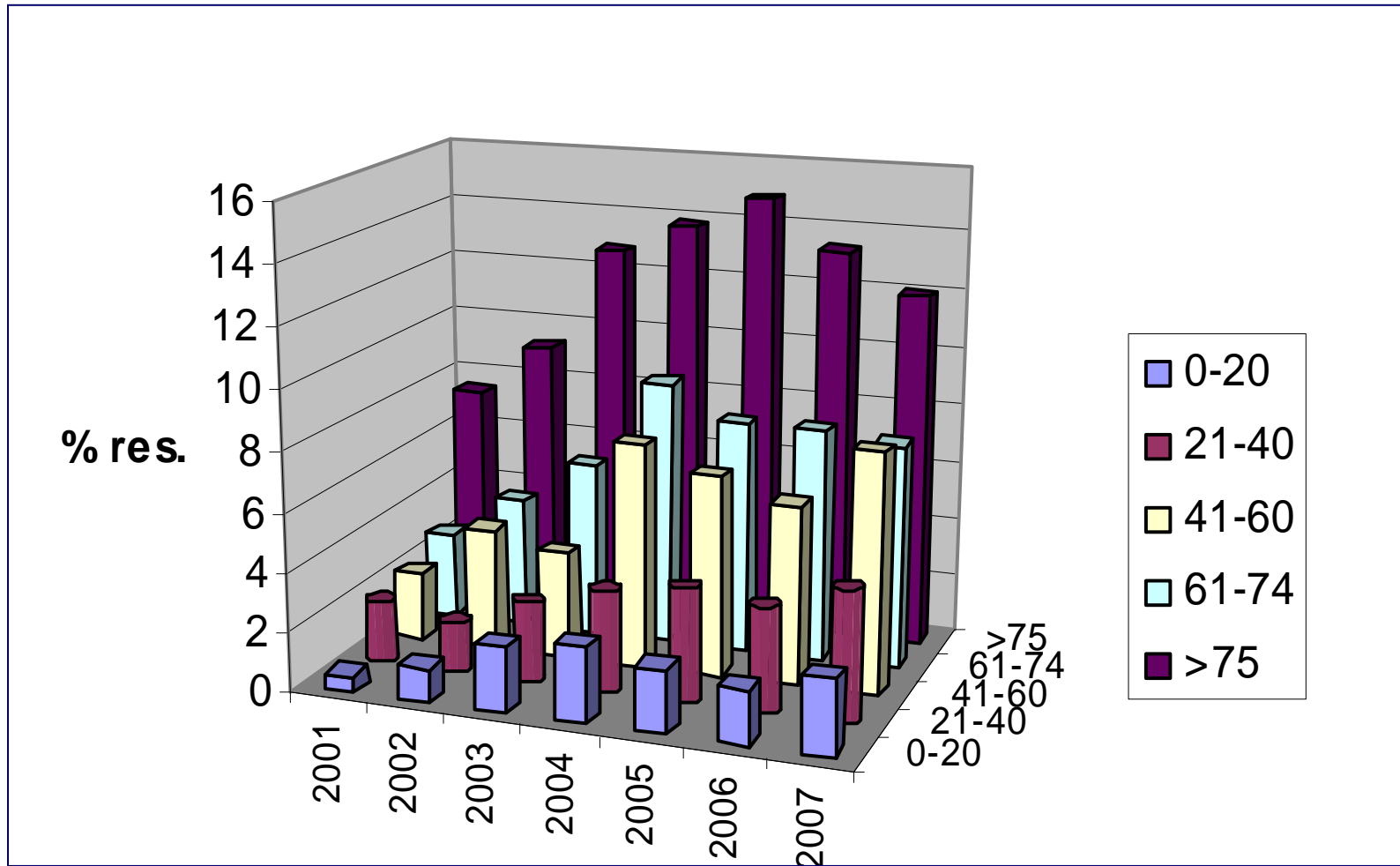


E. coli, urine isolates from female patients, antibiotic susceptibility by age groups 2006-2007

E. coli ESBL (%)



E. coli, urine isolates, resistance to norfloxacin 2001-2007 in consecutive age groups



Enterobacteriaceae, urine isolates 2007 (%R)

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

	E. coli	Kl. pneum.	Kl. oxytoca	Prot. mirab.
Nitrofurantoin	1	14	2	99
Mecillinam	4	5	6	4
Cephalexin	9	7	11	2
Norfloxacin	7	2	1	4
Sulphameth-trimet.	19	19	8	22
Trimetoprim	21	24	13	39
n	22776	2560	758	920

H. influenzae & M. catarrhalis 2007 (%R+I)

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

	H. influenzae	M. catarrh.
Ampicillin	14	98
Amoxycill-clavul.	1	0
Cefachlor	1	0
Cefuroxime	1	0
Doxycycline	2	0
Ciprofloxacin	0	0
Sulphameth-trim.	22	3
Azithromycin	0	0
n	746	350

Neisseria gonorrhoeae 2006-2007 (%R+I)

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

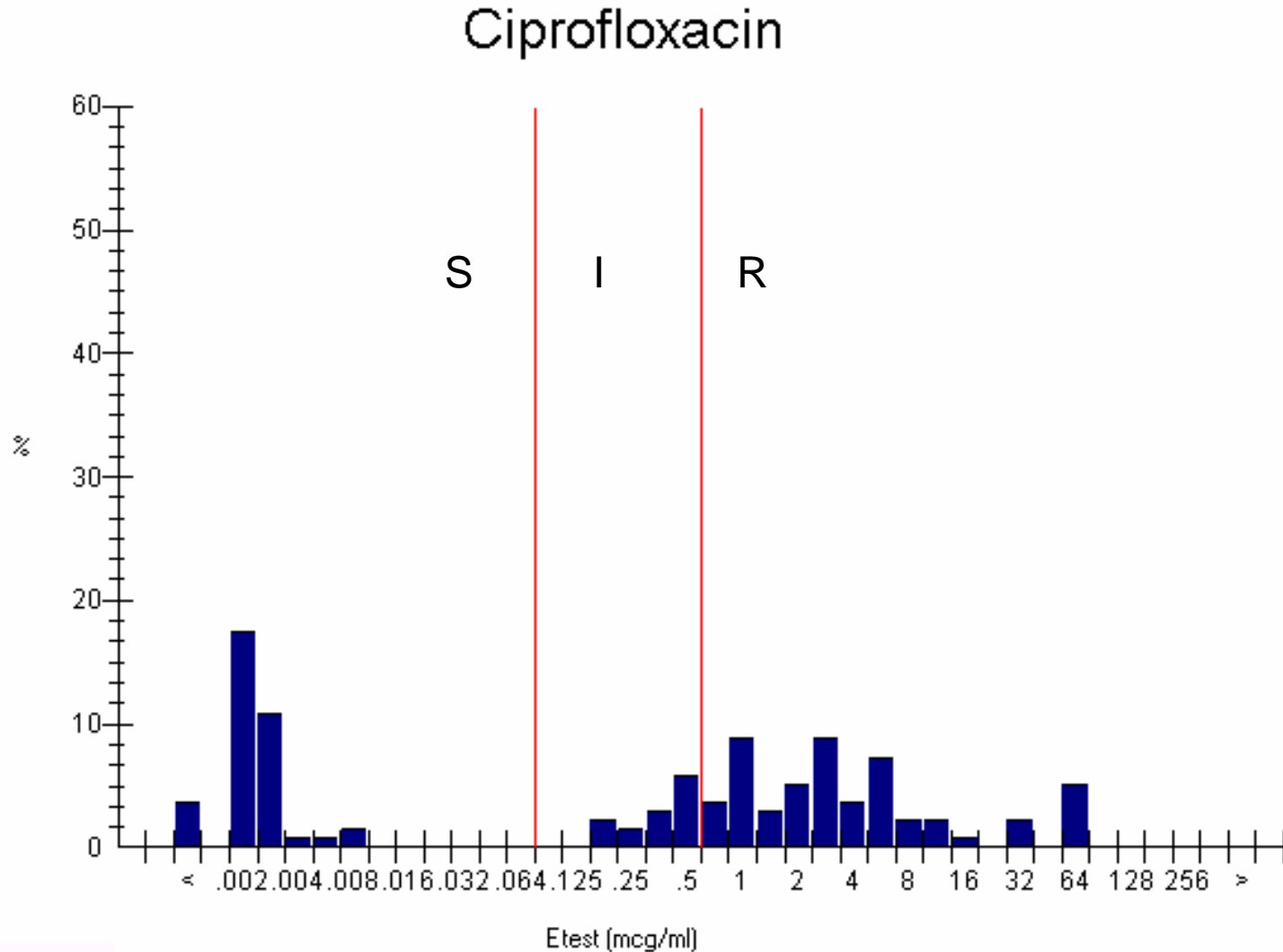
n = 139

Ciprofloxacin - R	53
Ciprofloxacin - I	12
Ceftriaxone	0
Azithromycin	1

N. gonorrhoeae 2006-2007, MICs of ciprofloxacin

HUSLAB material from Helsinki and Uusimaa Districts.

One isolate per patient (the first isolate). $n = 139$



Bacteroides fragilis group 2007 (%R+I)

HUSLAB material from Helsinki and Uusimaa Districts.

One isolate per patient (the first isolate).

n = 1180

Metronidazole	0
Piperacillin-tazobactam	1
Imipenem	1
Clindamycin	52
Doxycycline	6
Penicillin G	100

Prevotella spp. 2007 (% I+R)

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

n = 626

Penicillin	56
Piperacillin-Taz.	0
Doxycyclin	7
Metronidazole	0
Clindamycin	16

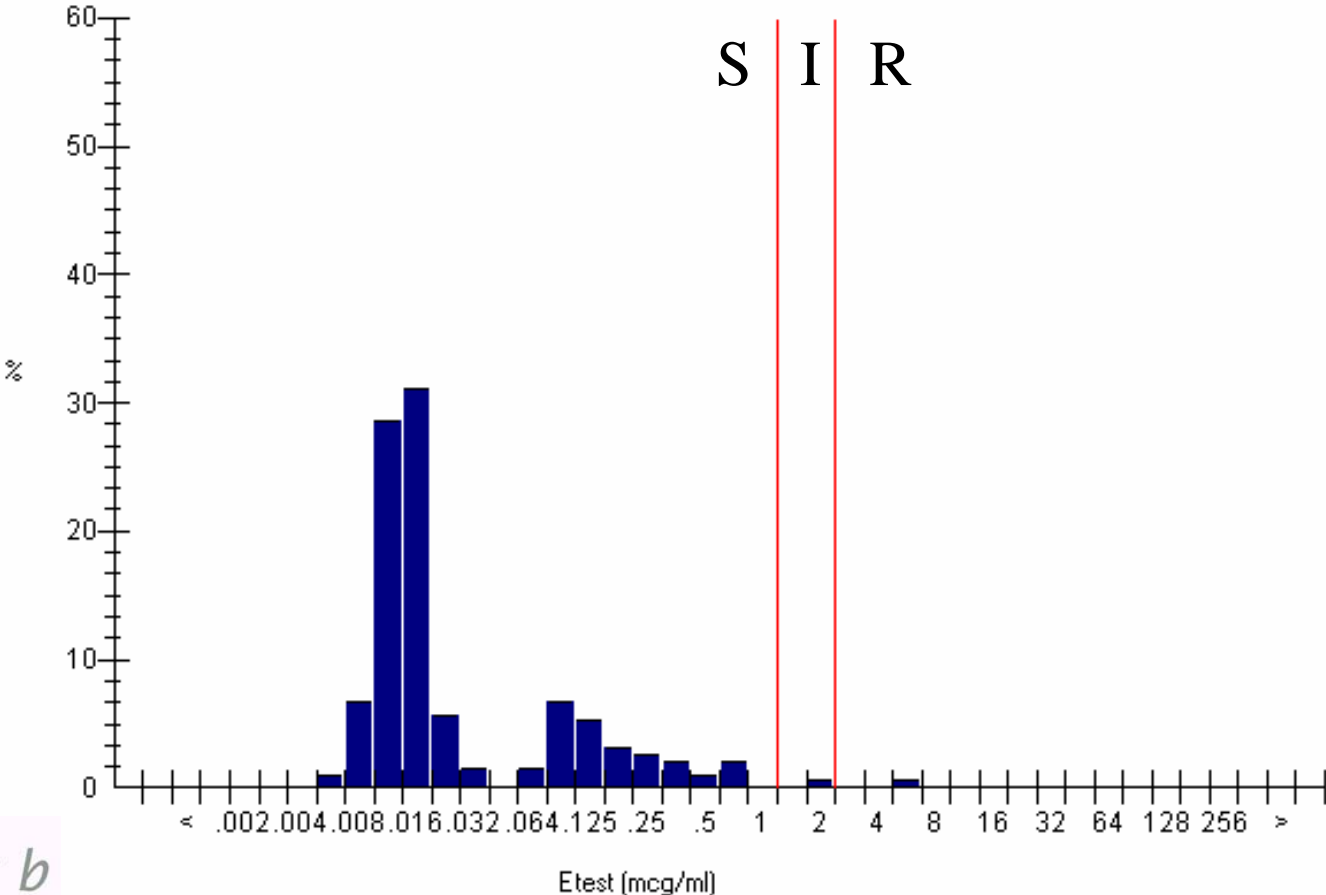
Salmonella 2007 -2007, susceptibilty to ciprofloxacin

HUSLAB material from Helsinki and Uusimaa Districts.

One isolate per patient (the first isolate).

n = 193, breakpoints according to CLSI

Ciprofloxacin

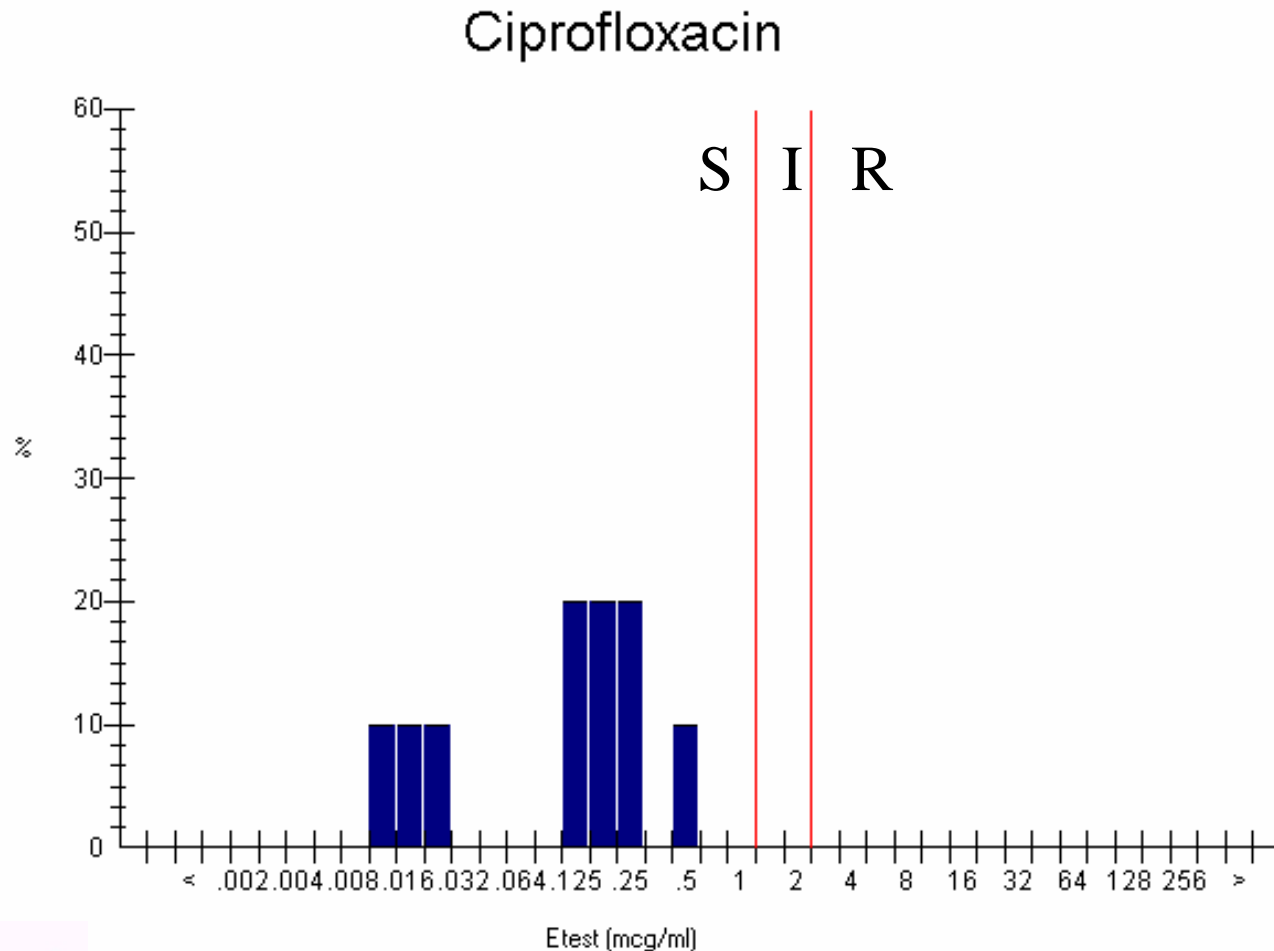


Salmonella typhi 2005 -2007, susceptibilty to ciprofloxacin

HUSLAB material from Helsinki and Uusimaa Districts.

One isolate per patient (the first isolate).

$n = 13$, breakpoints according to CLSI



Campylobacter 2007, resistance (%R+I) and multiresistance profiles

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

	C. jejuni	C. coli
Ciprofloxacin	56	54
Erythromycin	3	13
Cip + Ery	2	8
Cip + Ery + Dox	0,5	3
n	636	131