

HUSRES Annual Report 2006
Martti Vaara



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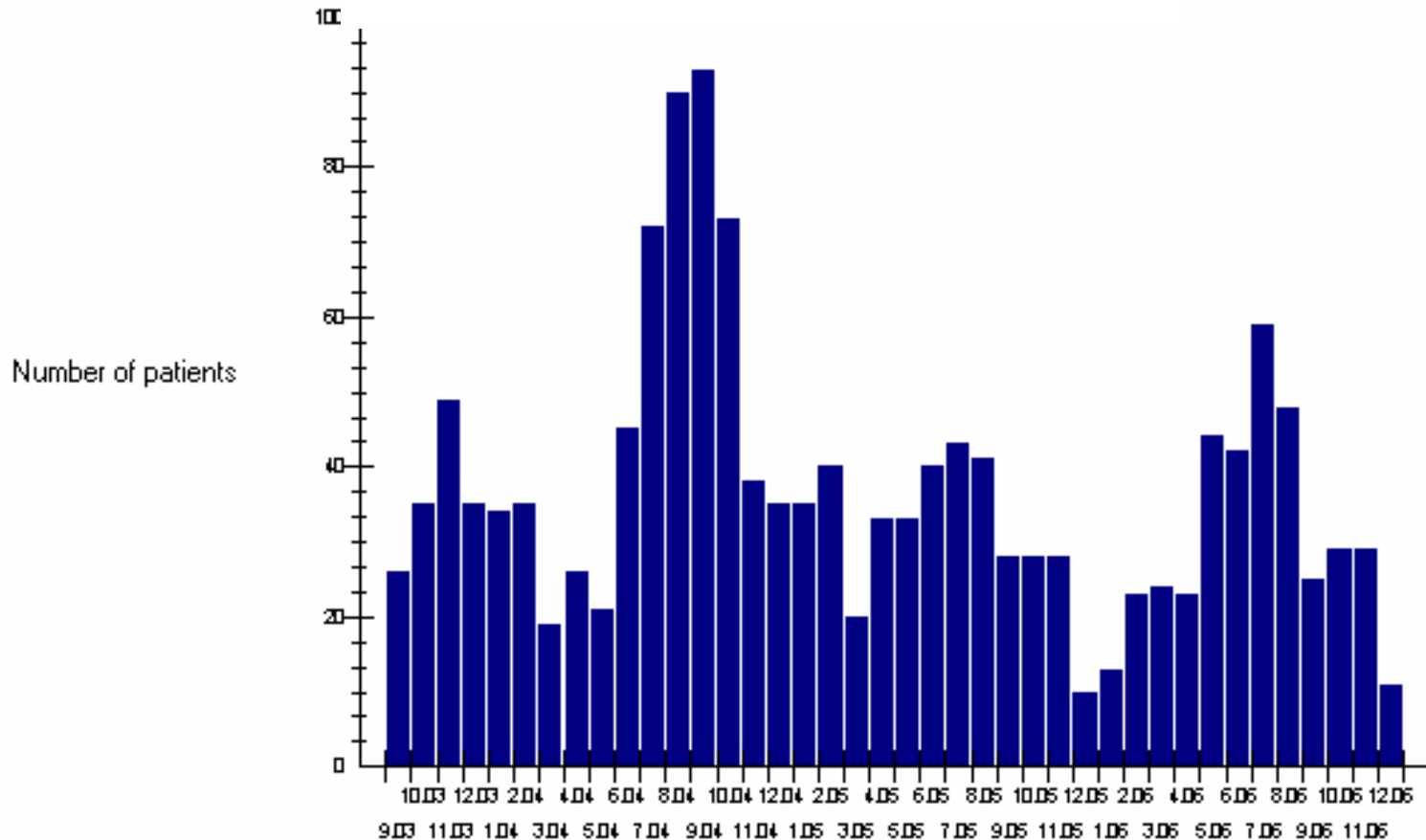
The basis of this HUSRES 2006 report is the HUSLAB/Whonet database 2006, which contains susceptibility data on about 137.000 bacteria isolated and studied in 2006 by HUSLAB.

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

HUSRES 2006 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 10/2003 – 2006 in Huslab material (Helsinki and Uusimaa District)



Staph. aureus 2006 (%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. The material does not include MRSA-strains isolated from MRSA screening cultures. One isolate per patient (the most resistant)

Material	n	Oxa	Ery	Cli	Lev	Rif	Fus	Tob	Net	Lnz	SxT
HUCH (7 hosp)	2108	6	10	9	6	1	5	5	0	0	2
Blood isolates	334	5	8	5	4	0	4	4	0	0	0
Outpatients	2677	4	7	5	4						
All sources	7231	4	8	6	5						

Multiresistance phenotypes in MRSA strains 2006, resistance profiles displayed by ≥ 5 isolates

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

									% freq	n of isolates with this pattern
Oxa	Ery	Cli	Lev	Tob					37 %	191
Oxa	Ery	Cli	Lev	Tob		Rif			3 %	13
Oxa	Ery	Cli	Lev						3 %	16
Oxa									24 %	121
Oxa						Fus			2 %	10
Oxa			Lev						7 %	36
Oxa			Lev	Tob					4 %	18
Oxa	Ery	Cli							2 %	8
Oxa				Tob					1 %	6
Oxa	Ery		Lev	Tob					1 %	6

Total number of isolates studied: 514

Resistance (to other than Oxa) defined here as non-susceptibility (= R+I)

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Staph. epidermidis 2006 (%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.	880	90	72	67	69	23	64	59	4	0	57
Childrens' hosp	175	85	67	58	31	17	67	58	6	0	58
All sources	3247	78	63	55	49	19	57	48	4	0	49

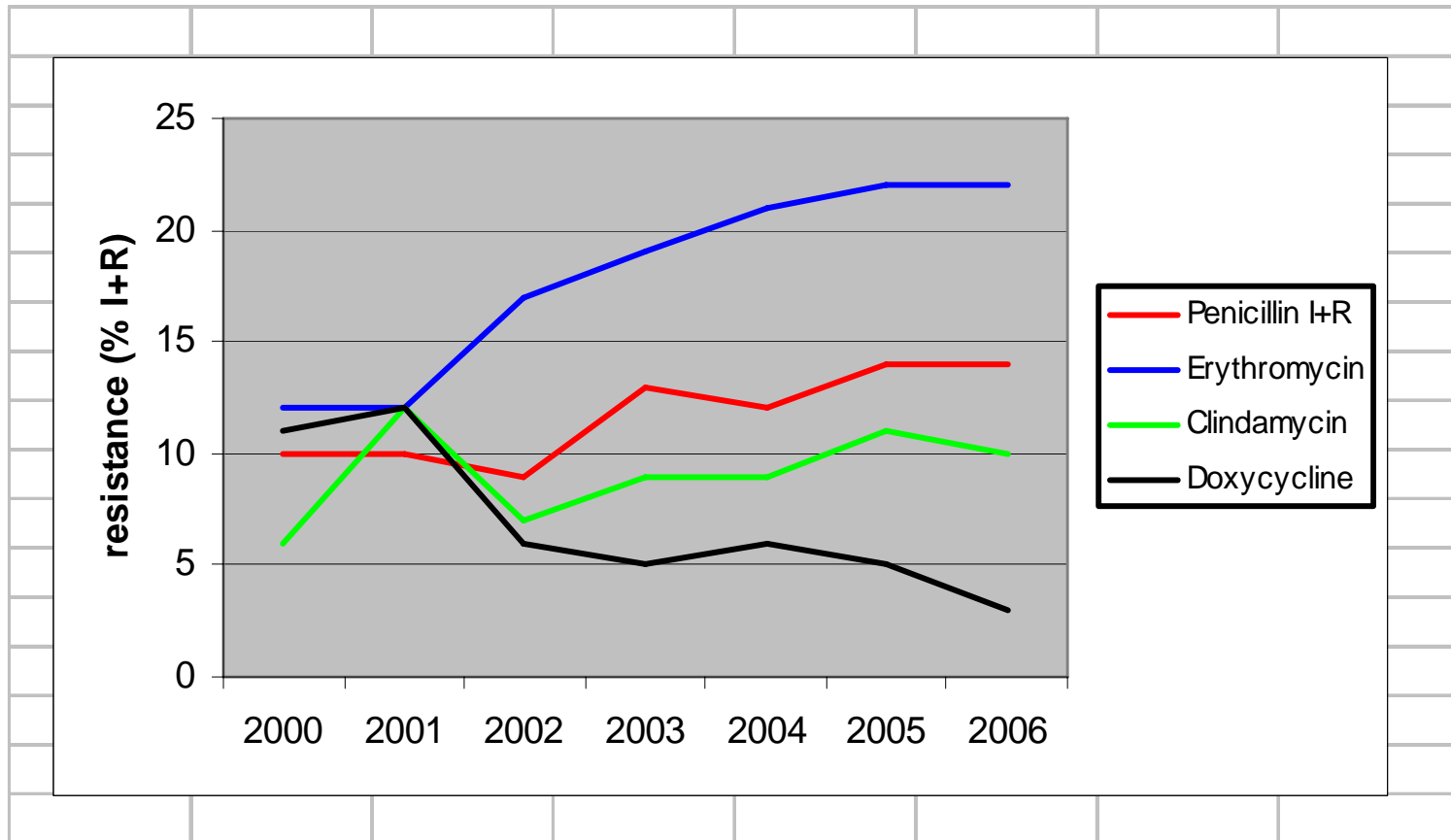
Streptococcus pneumoniae 2006 (%R+I)

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	2,7	1,1	4,4	2,4	2,9
Penicillin - I	10,7	8	15,4	12,4	5,9
Ceftriaxone - R	0,3	0	0	0,6	0
Ceftriaxone - I	0	0	0	0	0
Erythromycin	22	21	26	26	13
Clindamycin	10	7	14	13	7
Doxycycline	3		2	3	5
Sulphamet-Trim.	22		26	24	17
Levofloxacin		0			
Moxifloxacin		0			
Telithromycin		0			
<i>n</i>	742	186	182	338	102

Str. pneumoniae, resistance 2000 - 2006

Huslab material



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Multiresistance among *Str. pneumoniae* 2006, multiresistance profiles displayed by ≥ 10 isolates

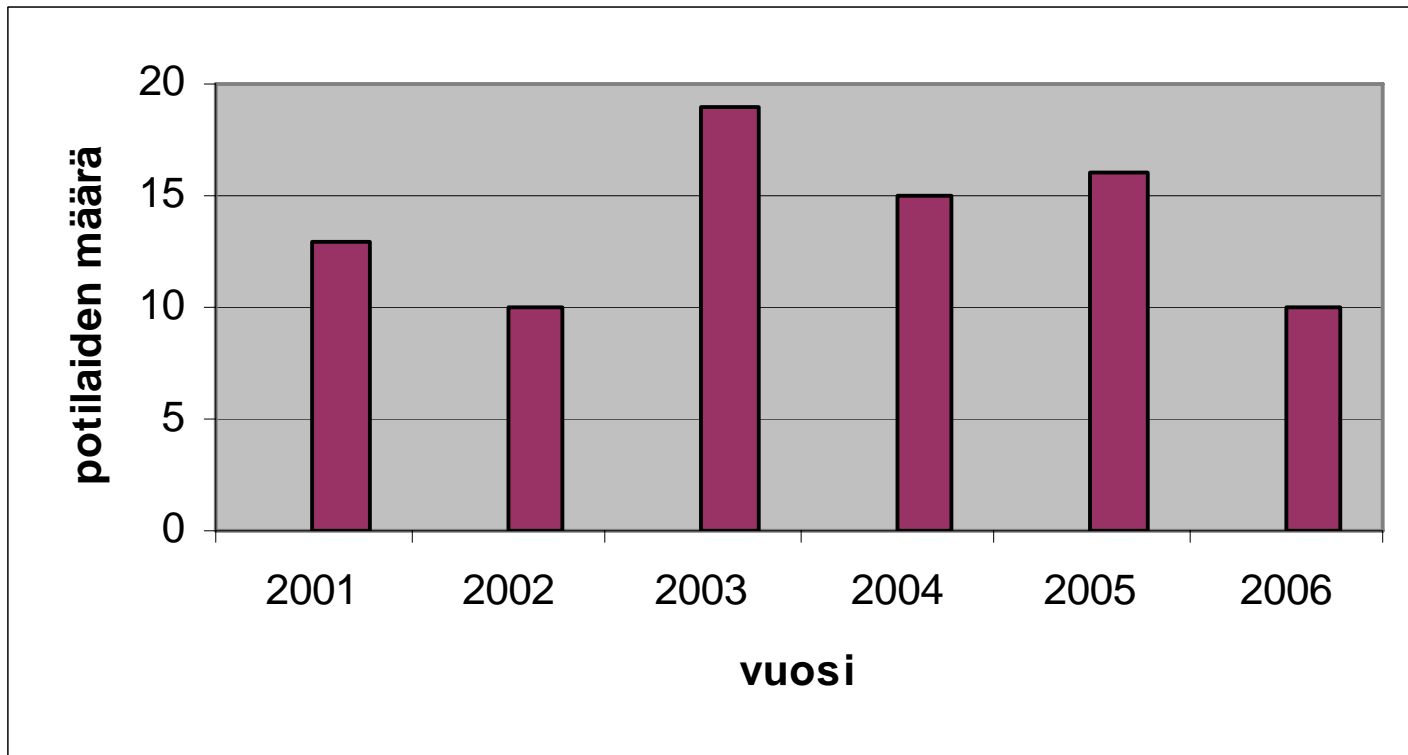
HUSLAB material from Helsinki and Uusimaa districts. One isolate per patient (the first isolate)

					% freq	n of isolates with this pattern
Pen	Ery	Cli	SxT	Dox	1,3	10
Pen	Ery	Cli	SxT		4,2	31
Pen	Ery		SxT		4	30

Total number of isolates studied: 742

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

Very multiresistant pneumococci (PenR/I, Ery, Cli, SxT, Dox) HUSLAB material 2001-2006



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Beta-hemolytic streptococci 2006 (%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	2	11	10
Clindamycin	2	9	7
n	5213	3890	2566

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

Streptococcus viridans group, blood isolates 2006

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

Penicillin -I	16
Penicillin -R	2
Ceftriaxone -I	0
Ceftriaxone -R	0
Erythromycin I+R	19
Clindamycin	8
Gentamycin -high res.	3
Vancomycin	0

n = 129

Str. anginosus [milleri] group 2006 (%R+I)

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

n = 621

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

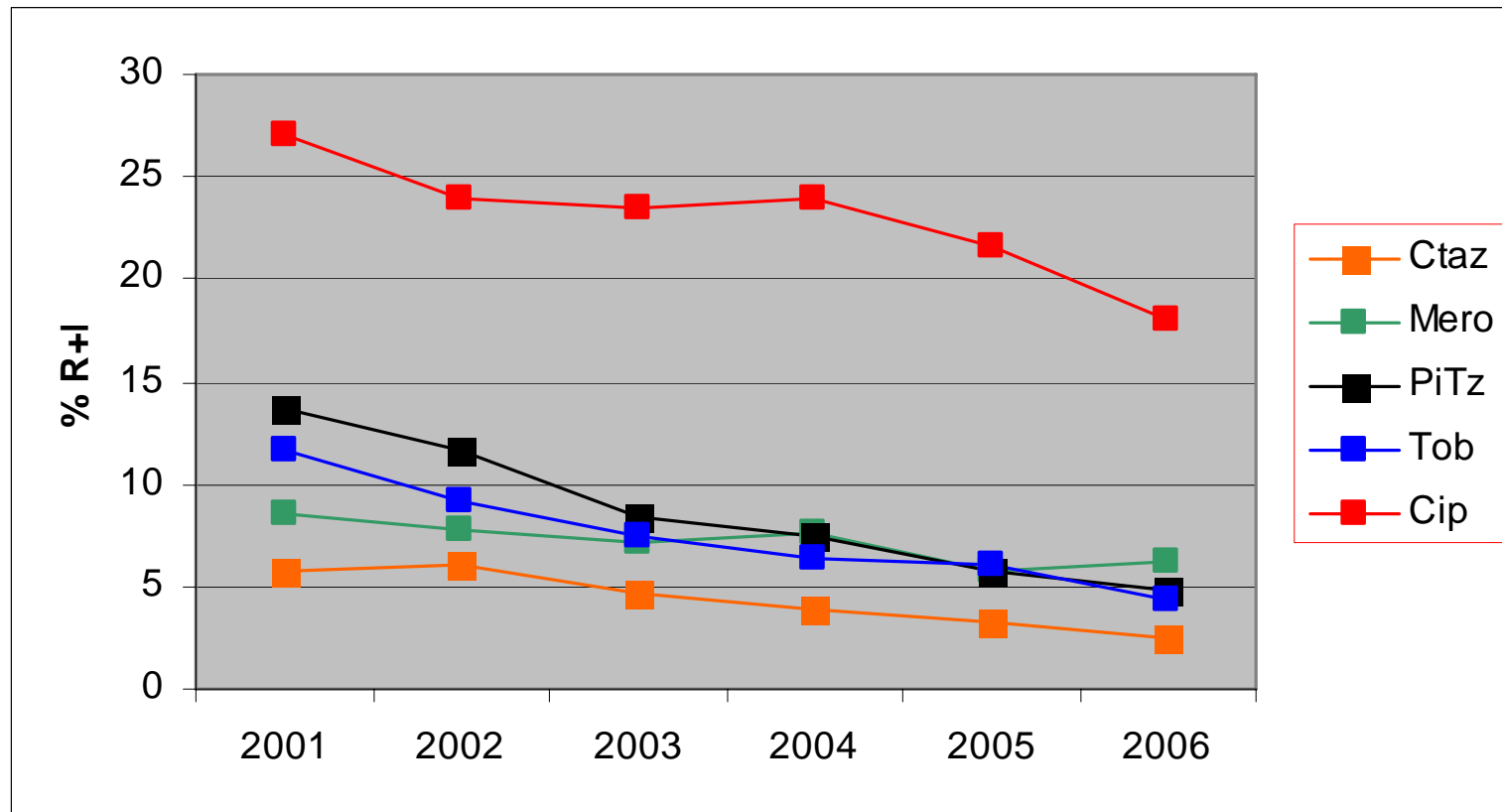
Enterococci 2006

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

	pus	blood	urine		pus	blood	urine
Ampicillin	0	0	0		92	85	96
Imipenem	0	0			91	87	
Linezolid-I	0	2			0	0	
Linezolid-R	0	0			0	0	
Vancomycin	0.1	0	0		3	2	0
Gentam. (hi)		29				20	
Levofloxacin		33				86	
Moxifloxacin		33				84	
Norfloxacin			31				96
Nitrofurantoin			0,5				50
Sulph-trimeth			26				77
<i>n</i>	1818	92	4728		585	62	1003

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Pseudomonas 2001-2006, % R+I, all Huslab sources



year	<i>n</i>
2001	3195
2002	3238
2003	3224
2004	3130
2005	2899
2006	3122

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Pseudomonas aeruginosa 2006 (%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	235	8	18	6	9	4	32
Töölö	175	5	14	9	4	1	33
Helsinki City hospitals	191	4	13	6	13	6	31
Maria	42	2	5	7	3	0	17
Childrens´	39	3	3	3	0	3	3
Uusimaa regional hospitals	245	7	11	5	6	3	26
Outpat. in Health Cntrs	536	2	5	4	3	1	12

Blood isolates from	n	Ctaz	Mero	Pi-Tz	Tob	Ami	Cip
Meilahti	16	6	6	0	6	0	13
Other sources	47	2	6	0	0	0	13

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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
all six (= panresistant)	3.0	1	0,4	0
five	4,2	3,4	1,9	0,8
four	11,1	6,5	5,7	2,4
total number of isolates studied	334	294	265	376

Pseudomonas aeruginosa 2006 (%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	149	3	3	3	6	19
Töölö	40	3	12	6	0	21
Helsinki City hospitals	334	4	6	5	6	22
Maria	211	2	5	7	8	26
Childrens´	57	0	0	0	0	0
Uusimaa regional hospitals	197	3	5	3	4	22
Outpat. in Health Cntrs	771	2	5	6	5	21

Acinetobacter spp. 2006 (%R+I)

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

Hospital	n	Ctaz	Mero	Pi-Tz	Tob	Cip	SuTri
Meilahti	81	10	6	14	6	12	14
Töölö	90	21	16	17	18	17	23
Other sources	393	18	9	15	6	16	9

Acinetobacter spp. in Töölö hospital 2002 - 2006

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

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
all seven (= panresistant)	1	19	7
six	1	0	0
five	5	5	3
four	2	4	1
total number of isolates studied	101	153	92

Stenotrophomonas maltophilia 2006 (%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	87	9	29	49
Töölö	47	4	13	52
Childrens´	13	8	39	71
Other sources	205	8	13	36

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

Enterobacteriaceae 2006 (%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	993	8,6	5,9	5,9*	7	13	0
Kl. pneumoniae	215	11,1	3,2	3,2*	4	8	0
Kl. oxytoca	144	8,4	1,4	1,4	1	1	0
Proteus mirabilis	86	2,3	1,2	1,2*	0	4	0
Ent. cloacae	327	43	27	27**	2	3	0
Enterobact. spp.	282	40	25	25**	3	2	0
Citrob. freundii	34	38	31	31**	0	6	0
Serratia marc.	110	90	9	9**	7	4	0
Proteus vulgaris	45	90	0	0**	2	0	0
Morganella morg	67	84	2	2**	3	3	0
Total	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

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ESBL 2006 (% frequency) at different locations

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

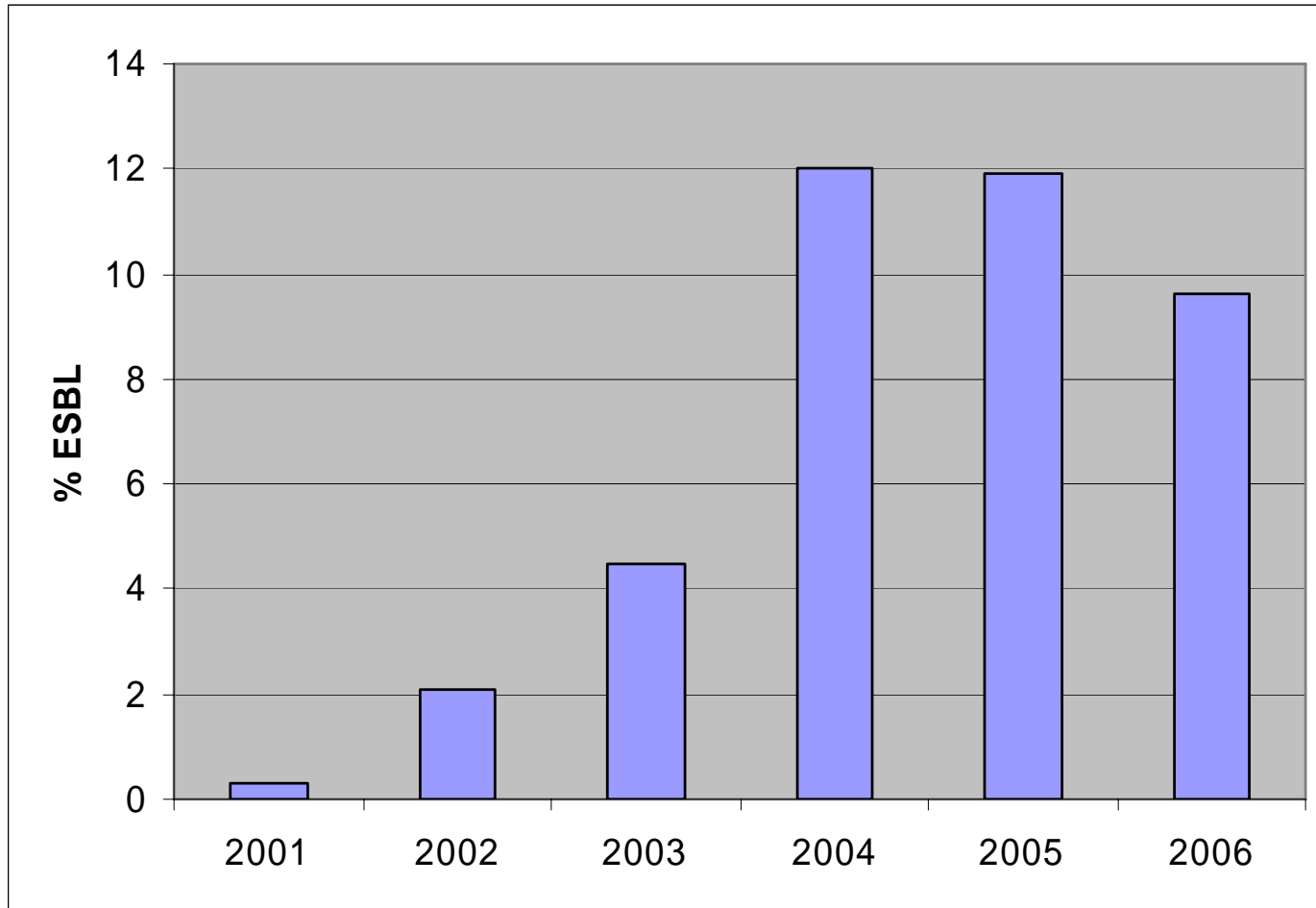
Material	E. coli		K. pneumoniae	
	pus & blood	urine	pus & blood	urine
HUCH (7 hospitals)	5,3	3,2	3,2	2,1
Helsinki City hospitals	16,8	9,3	(14,3)	4,4
Helsinki City outpatients	8,4	2,4	0	0,9
Uusimaa hospitals	1,3		3,8	
All sources	4,6	2,4	3,3	1,3
<i>Total n of isolates studied</i>	2339	20966	483	2317

ESBL isolates (*n*) at different locations 2006

HUSLAB material from Helsinki and Uusimaa districts. One isolate per patient

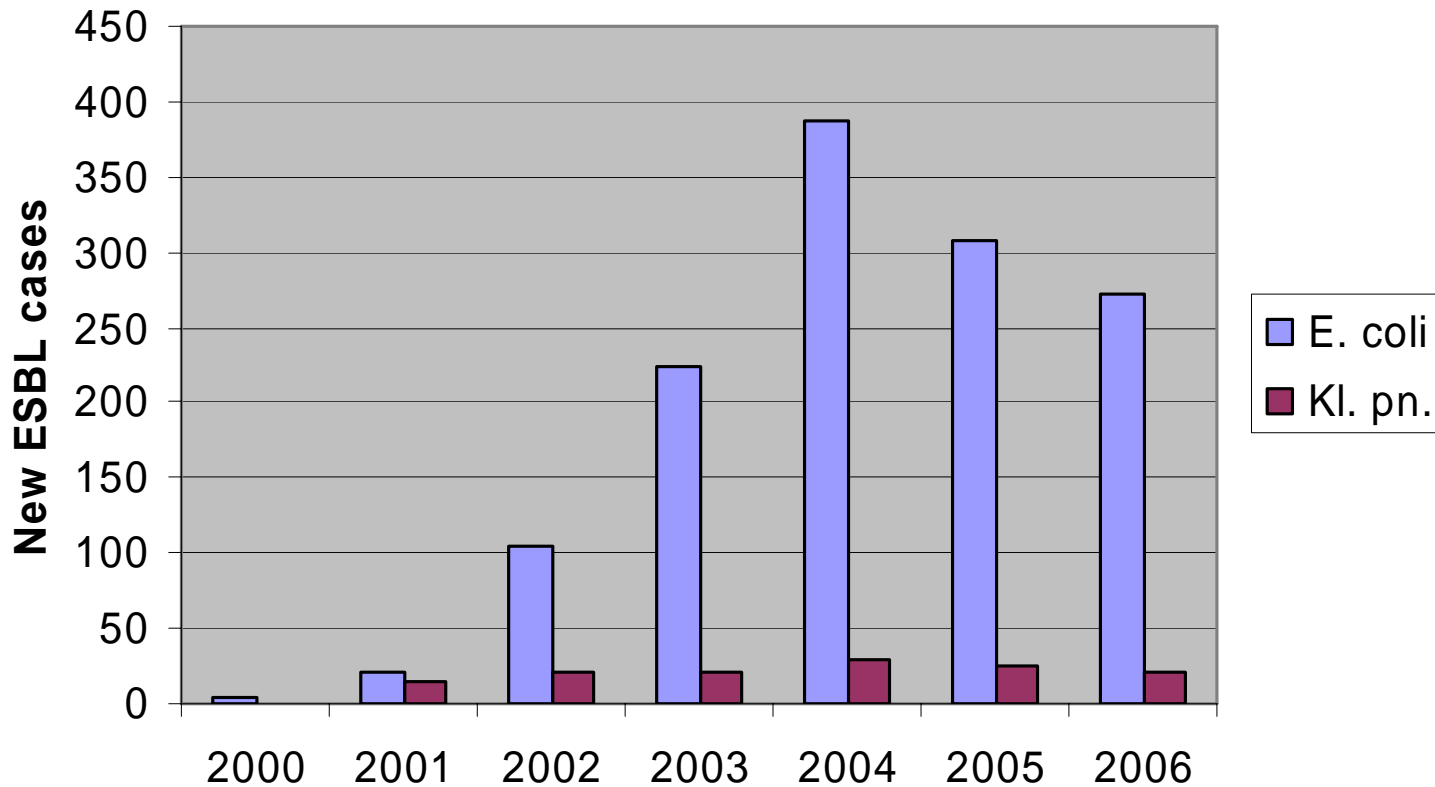
Material	E. coli		K. pneumoniae	
	pus & blood	urine	pus & blood	urine
HUCH (7 hospitals)	53	140	7	11
Helsinki City hospitals	37	166	6	12
Helsinki City outpatients	11	232	0	9
Uusimaa hospitals	8	23	4	1
All sources	107	508	16	29

Frequency of *E. coli* ESBL in Helsinki City Hospitals 2001 - 2006



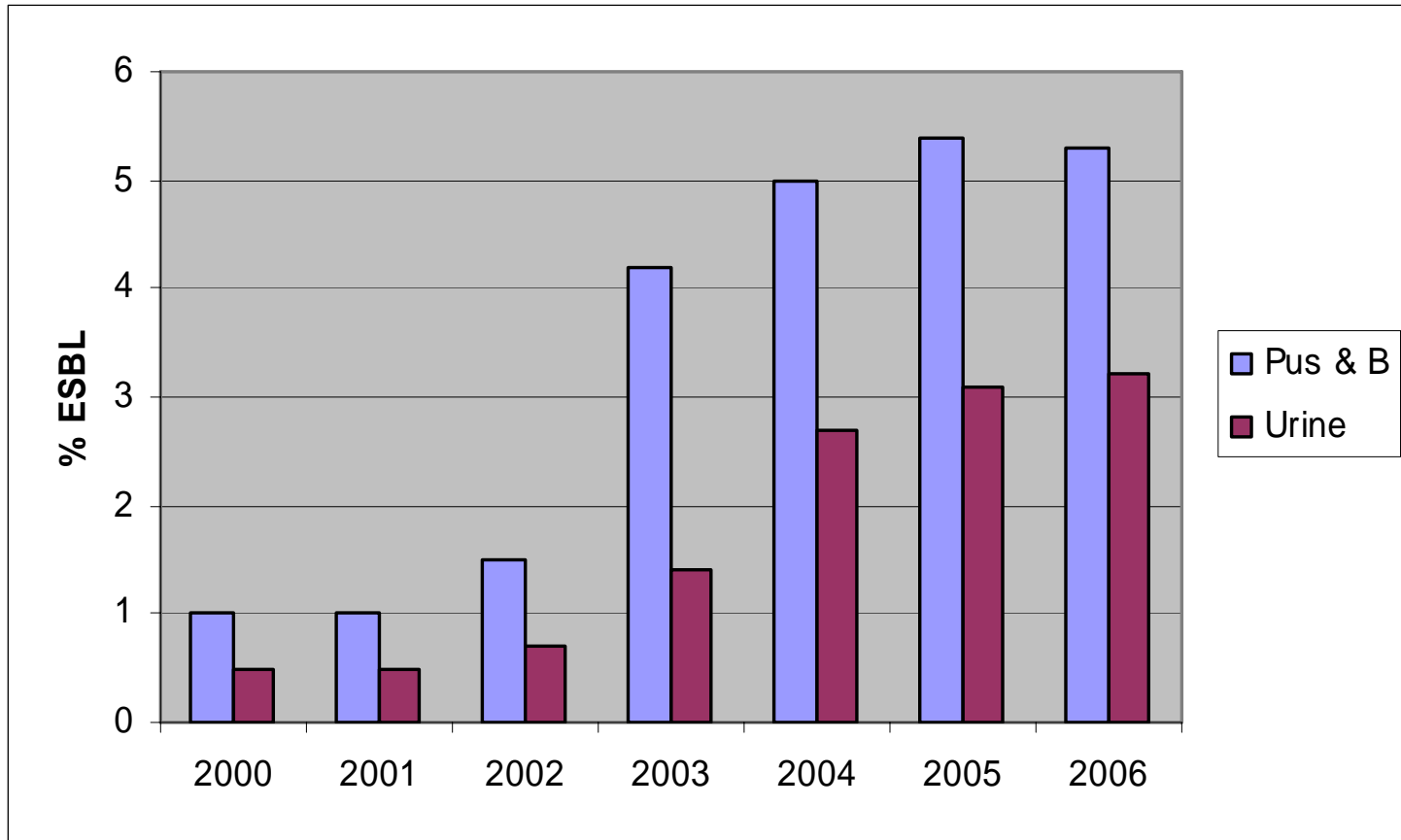
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The yearly number of new ESBL cases in Helsinki Health Center



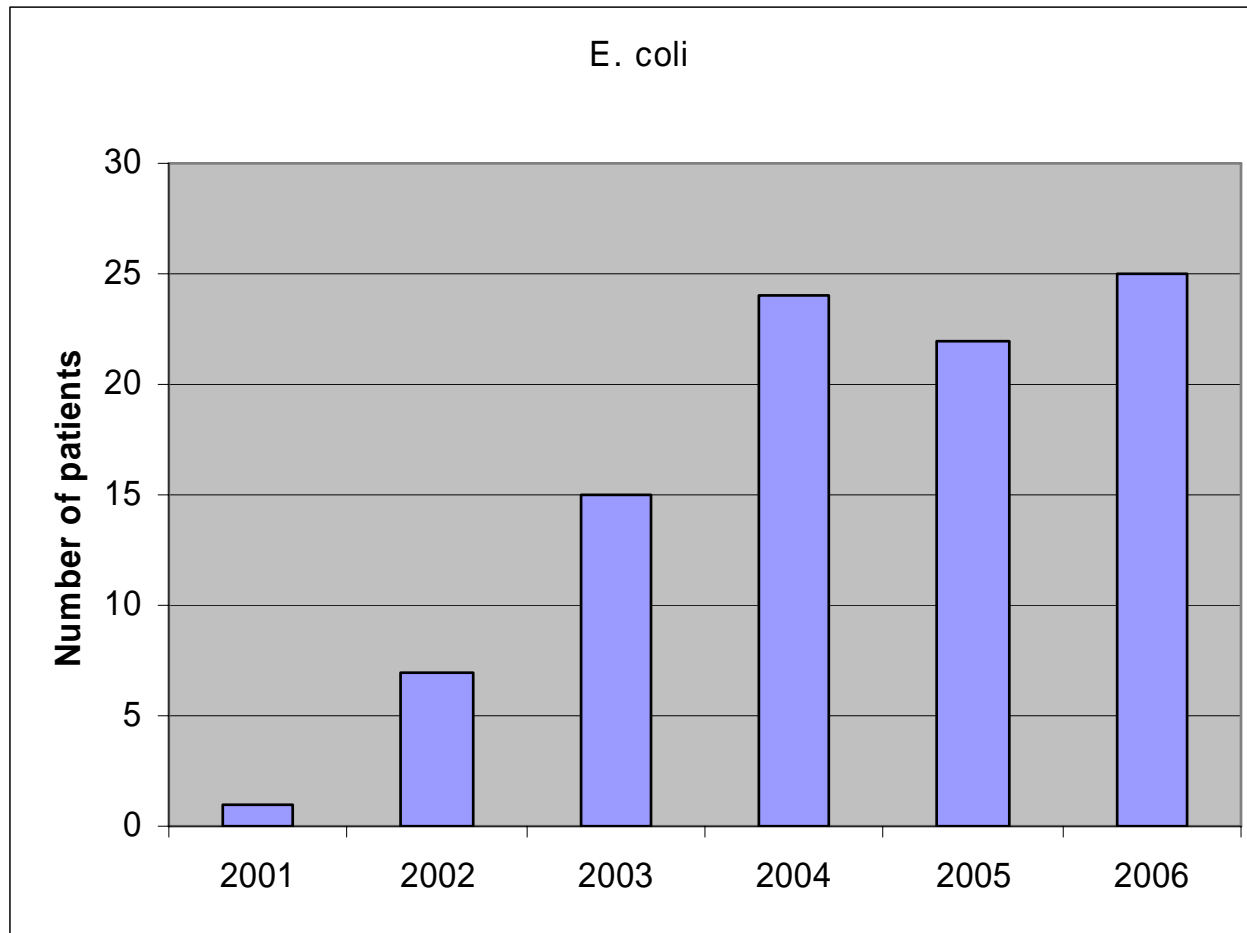
Frequency of E. coli ESBL at HUCH/Helsinki 2000 - 2006

One strain per patient

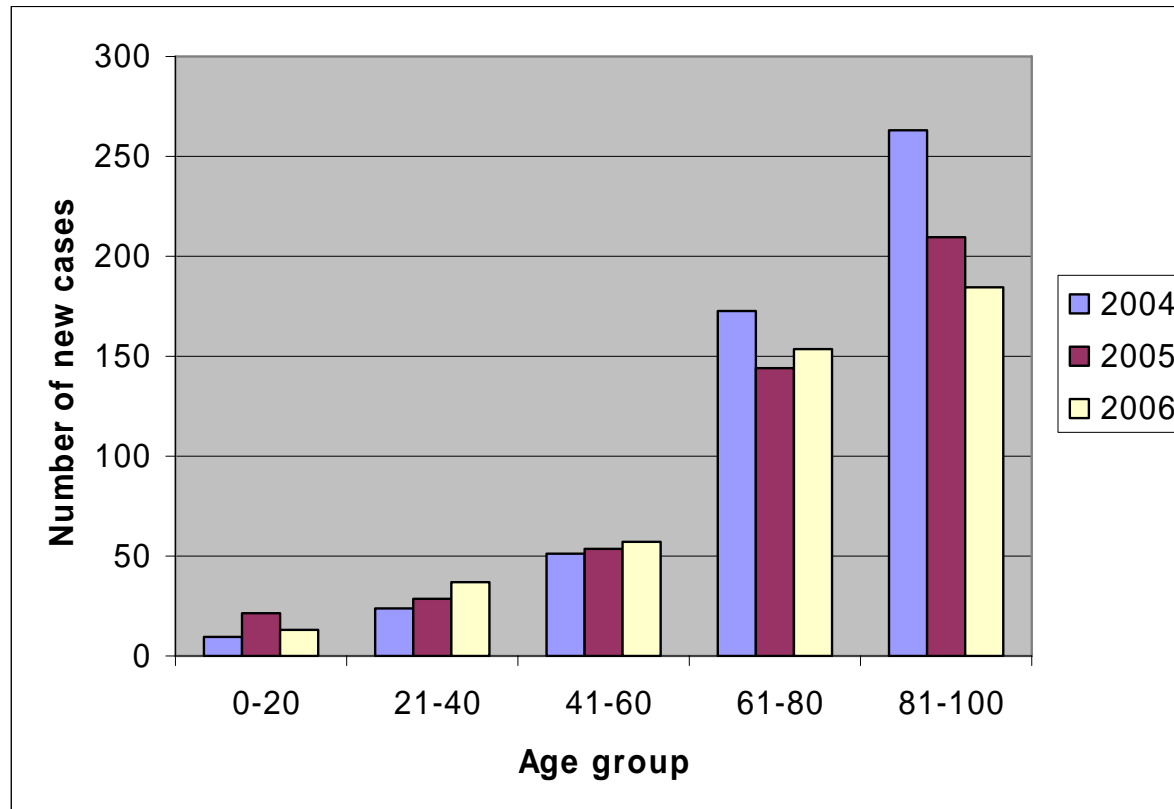


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Bacteremias by E. coli ESBL, HUSLAB material 2001-2006



E. coli ESBL in Huslab material 2004 – 2006, Number of new cases by age categories



E. coli ESBL strains, resistance to non-betalactams and meropenem 2005 - 2006

% 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	88	88	90	66
Levofloxacin	88	87		
Norfloxacin			91	72
Tobramycin	73	70	74	55
Sulphatrimetoprim	48	33	34	62
Trimetoprim			40	65
Nitrofurantoin			12	12
Meropenem	0	0	0	0
<i>n</i>	40	166	912	112

K. pneumoniae ESBL strains, resistance to non-betalactams and meropenem 2005 - 2006

% 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)

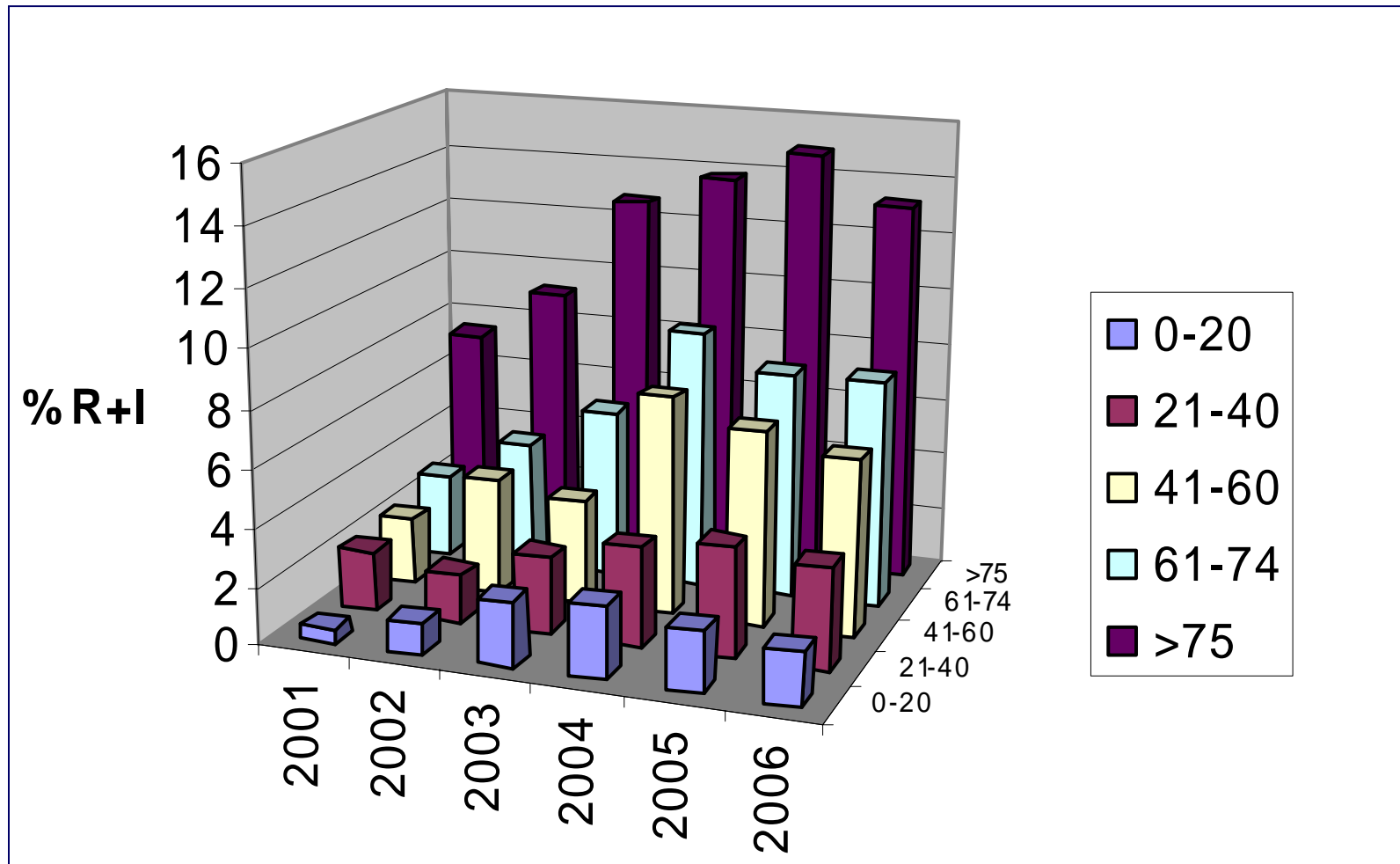
Antibiotic	Pus & Blood	Urine
Ciprofloxacin	96	72
Levofloxacin	96	
Norfloxacin		72
Tobramycin	96	77
Sulphatrimetoprim	63	78
Trimetoprim		82
Nitrofurantoin		75
Meropenem	0	0
<i>n</i>	27	60

E. coli, urine isolates 2006 (%R)

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

	Outpatients, age (in years)				
	0-20	21-40	41-60	61-74	≥ 75
Nitrofurantoin	0	0	1	1	3
Mecillinam	2	1	2	2	5
Cephalexin	4	4	5	6	12
Norfloxacin	2	3	4	4	10
Sulphameth-trimet.	17	19	17	17	21
Trimetoprim	19	20	18	18	23
n	1455	2596	1992	2440	4667

E. coli, urine isolates, resistance to norfloxacin 2001-2006 in consecutive age groups



Enterobacteriaceae, urine isolates 2006 (%R)

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

	E. coli	Kl. pneum.	Kl. oxytoca	Prot. mirab.
Nitrofurantoin	2	15	3	99
Mecillinam	3	5	7	6
Cephalexin	8	7	9	3
Norfloxacin	7	3	1	4
Sulphameth-trimet.	19	21	10	24
Trimetoprim	20	27	12	39
n	20966	2317	673	897

H. influenzae & M. catarrhalis 2006 (%R+I)

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

	H. influenzae	M. catarrh.
Ampicillin	11	95
Amoxycill-clavul.	0	0
Cefachlor	1	0
Cefuroxime	0	0
Doxycycline	2	0
Ciprofloxacin	0	0
Sulphameth-trim.	19	3
Azithromycin	0	0
n	579	286

Neisseria gonorrhoeae 2005-2006 (%R+I)

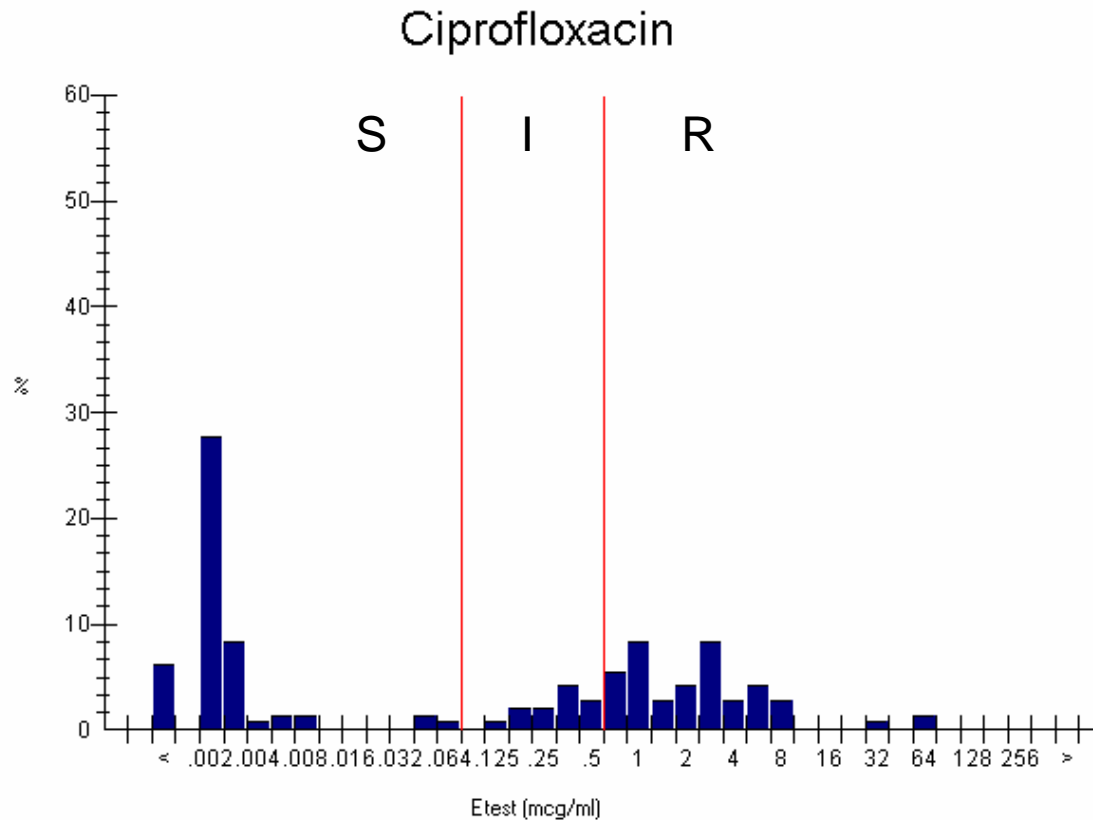
HUSLAB material from Helsinki and Uusimaa Districts.
One isolate per patient (the first isolate).

n = 148

Ciprofloxacin - R	41
Ciprofloxacin - I	12
Ceftriaxone	0
Azithromycin	1

N. gonorrhoeae 2005-2006, susceptibility to ciprofloxacin

HUSLAB material from Helsinki and Uusimaa Districts.
One isolate per patient (the first isolate). $n = 148$



Bacteroides fragilis group 2006 (%R+I)

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

n = 1119

Metronidazole	0
Piperacillin-tazobactam	1
Imipenem	1
Clindamycin	56
Doxicycline	7
Penicillin G	100

Prevotella spp. 2006 (% I+R)

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

n = 341

Penicillin	57
Piperacillin-Taz.	0
Doxicyclin	12
Metronidazole	0
Clindamycin	17

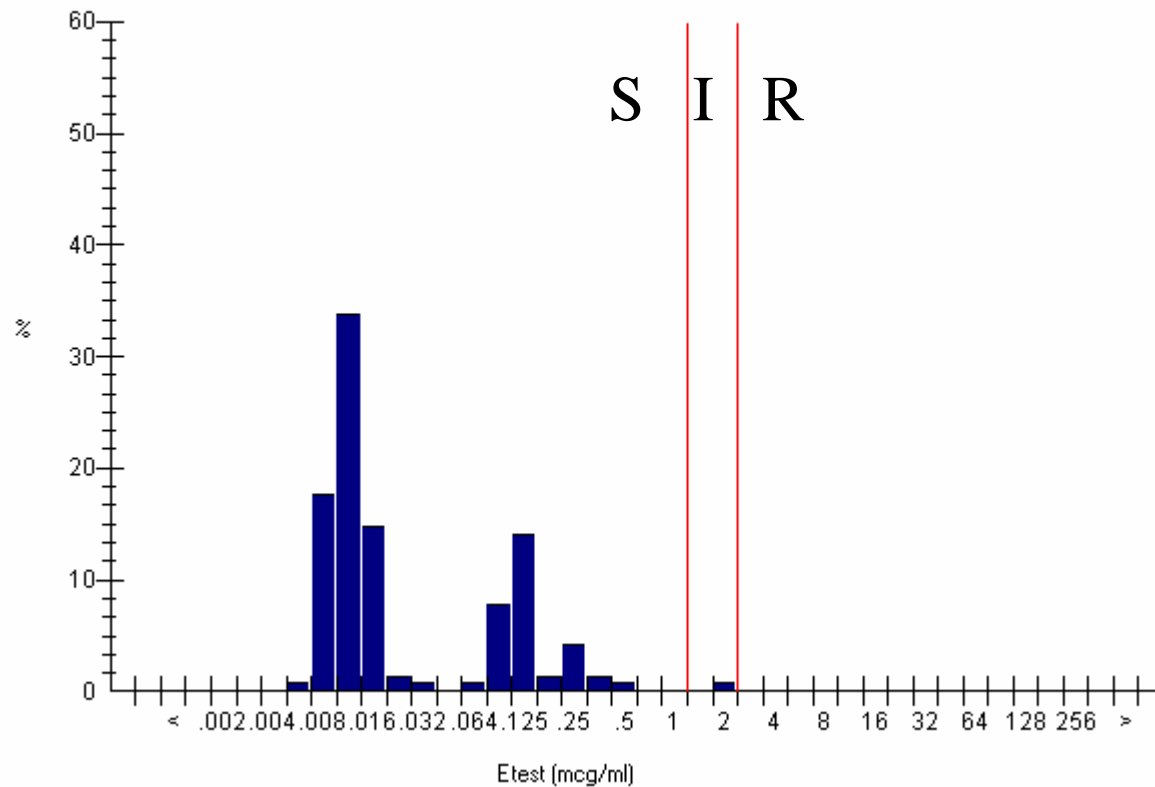
Salmonella 2005 -2006, susceptibilty to ciprofloxacin

HUSLAB material from Helsinki and Uusimaa Districts.

One isolate per patient (the first isolate).

n = 142, breakpoints according to CLSI

Ciprofloxacin



Campylobacter 2006, 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	54	61
Erythromycin	2	13
Cip + Ery	1	7
Cip + Ery + Dox	0.2	3
n	493	69