

HUSRES Annual Report 2013
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www.huslab.fi

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The basis of this HUSRES 2013 report is the HUSLAB/Whonet database 2013, which contains susceptibility data on more than 190.000 microbes isolated and studied in 2013 by HUSLAB. The susceptibility interpretations are according to EUCAST 2014.

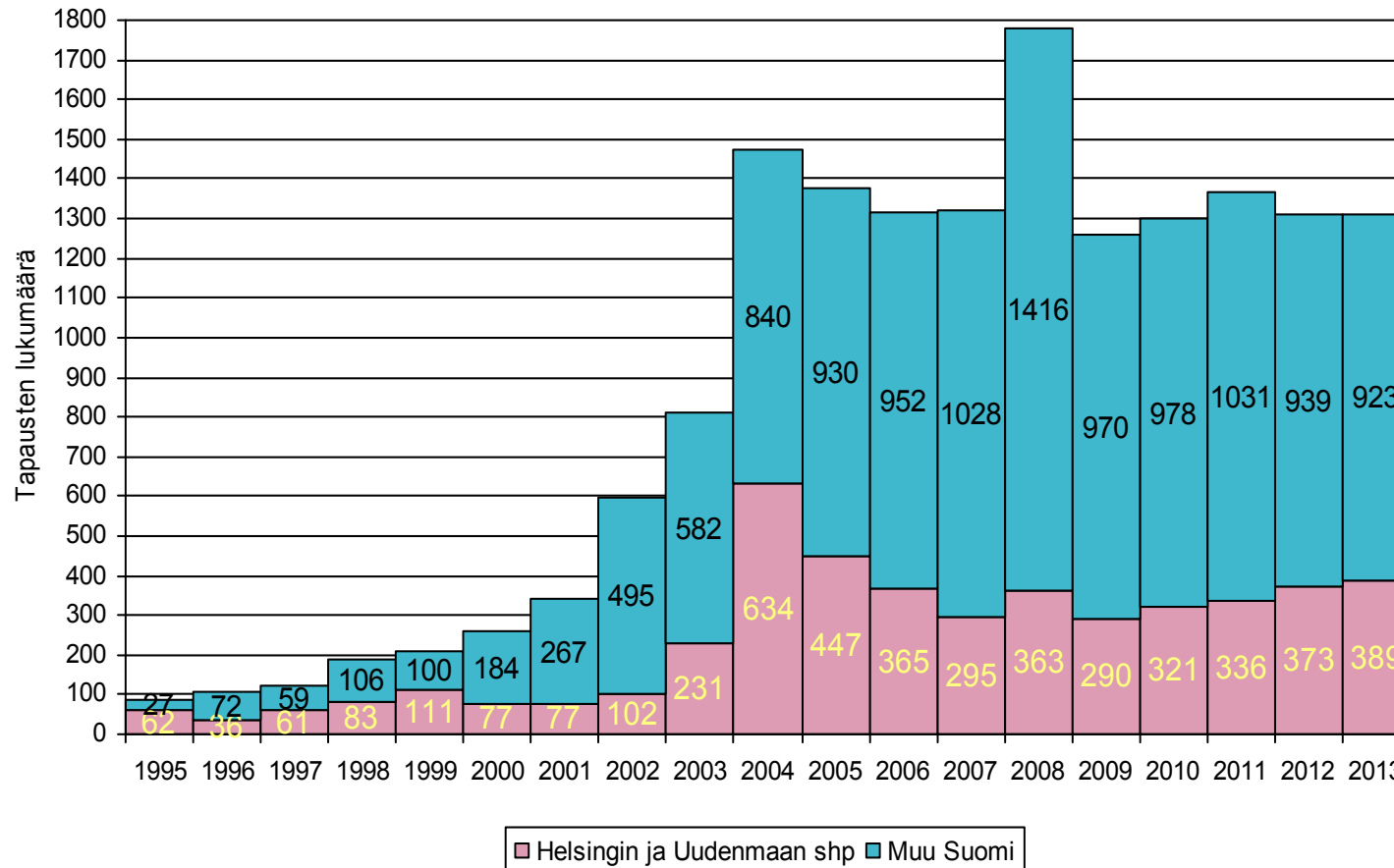
The isolates originate from patients in Helsinki University Central Hospital, other hospitals in Helsinki - Uusimaa region, as well as outpatient health centers.

HUSRES 2013 report contains data on 31 clinically most important bacterial species/groups.

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

MRSA cases in Finland 1995 – 2013

Pink columns: Helsinki and Uusimaa District, blue columns: other parts of Finland



Source: National Institute for Health and Welfare

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Staph. aureus 2013 (%R+I)

Pus and blood isolates from Helsinki University Central Hospital, Helsinki City hospitals, and other sources. One isolate per patient (the most resistant). MRSA screenings excluded.

Material	n	Oxa	Ery	Cli	Lev	Rif	Fus	Dox	Net	Lnz	SxT
HUCH	3056	3	7	6	3	2	9	4	0	0	0
Jorvi Hospital	706	3	7	5	4	1	7	5	0	0	1
Peijas Hospital	422	3	5	5	2	0	7	5	0	0	0
Hyvinkää Hosp	399	1	5	5	2	2	11	4	0	0	0
Helsinki City H	697	6	7	5	4	3	10	3	0	0	0
Outpatients	3862	3	6	5	2		7				

Coagulase-negative *staphylococci* 2013 (%R+I)

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

	n	Oxa	Ery	Cli	Lev	Rif	Fus	Dox	Net	Lnz	SxT
St. epidermidis	1161	75	57	46	53	12	62	18	22	0	40
St. haemolyticus	57	90	80	46	83	4	39	30	28	0	59
St. lugdunensis	180	1	13	12	3	0	6	16	0	0	3

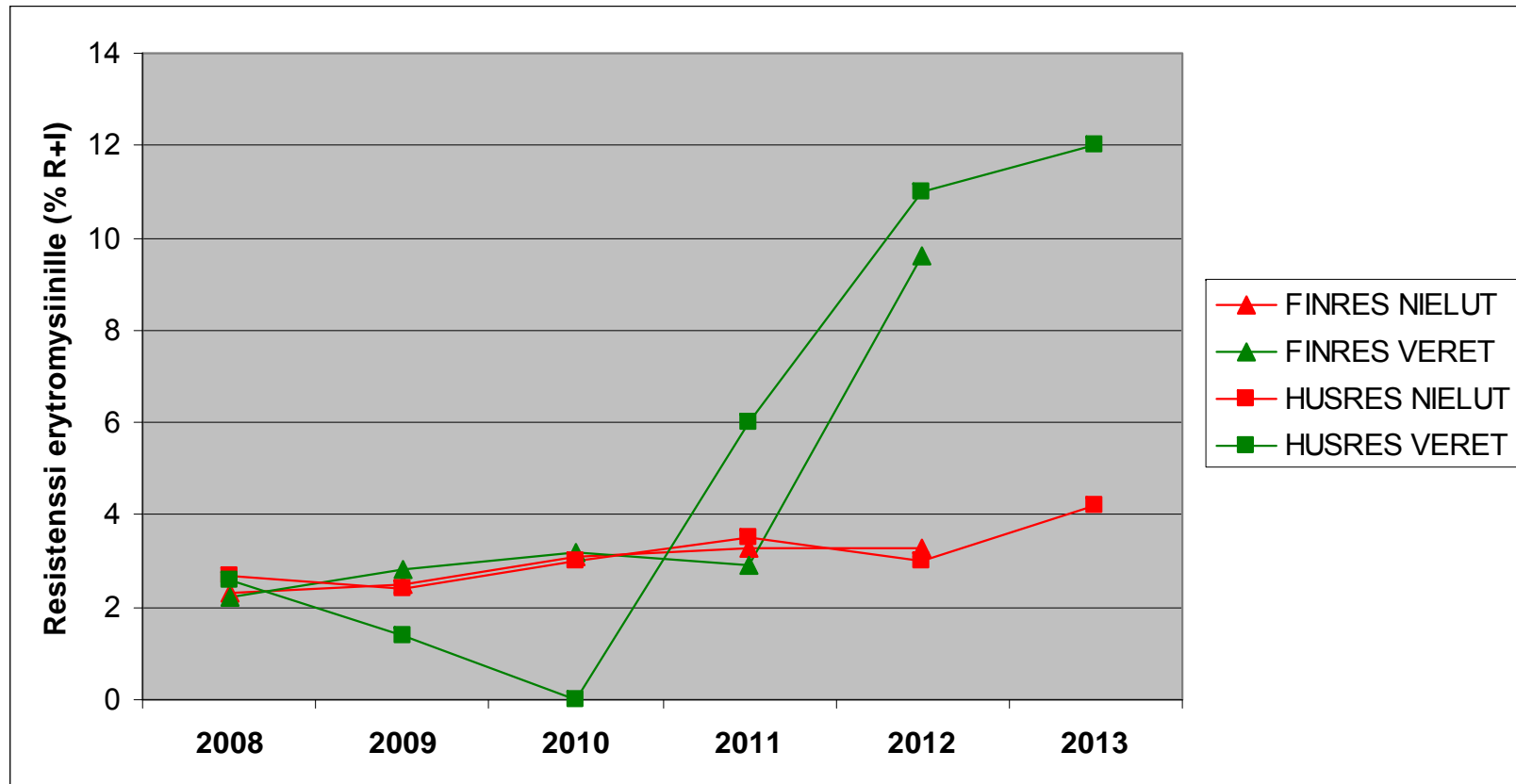
Beta-hemolytic streptococci 2013 (%R+I)

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

	S. pyogenes	Group B	Group C	Group G
Penicillin	0	0	0	0
Cephalosp. I gen	0	0	0	0
Erythromycin	5	13	8	15
Clindamycin	5	11	7	13
n	9925	5266	1367	3849

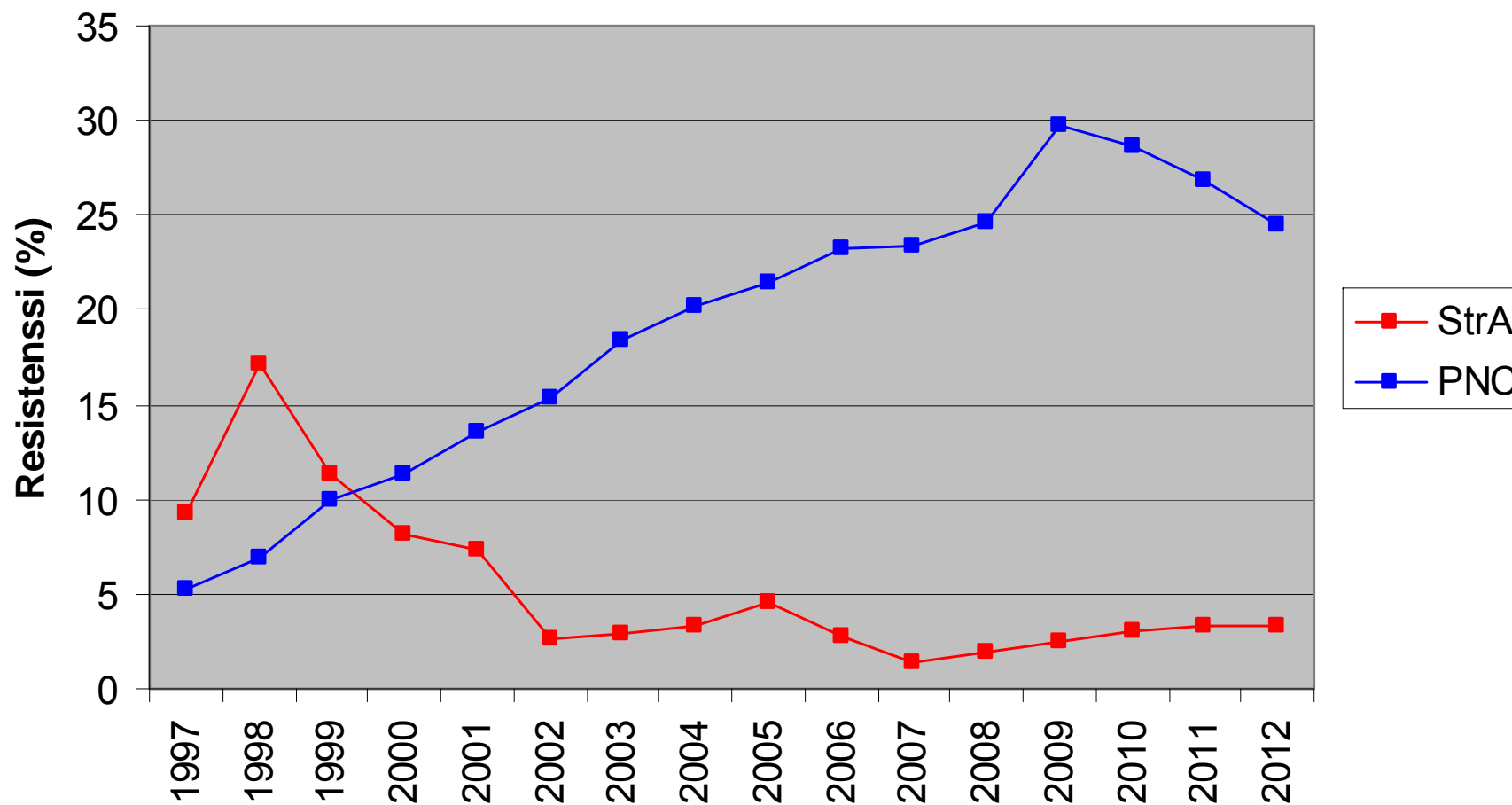
Group G: *S. dysgalactiae* spp. *equisimilis* group G strains

Streptococcus pyogenes, nonsusceptibility to erythromycin (% I+R) in strains isolated from throat (red symbols) and from blood (green symbols). Material from HUSLAB (squares) and from nationwide data collection (triangles).



Source: HUSLAB and THL

S. pneumoniae and S. pyogenes, nonsusceptibility to erythromycin (% I+R) in 1997-2012 in Finland



Streptococcus pneumoniae 2013 (%R+I)

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

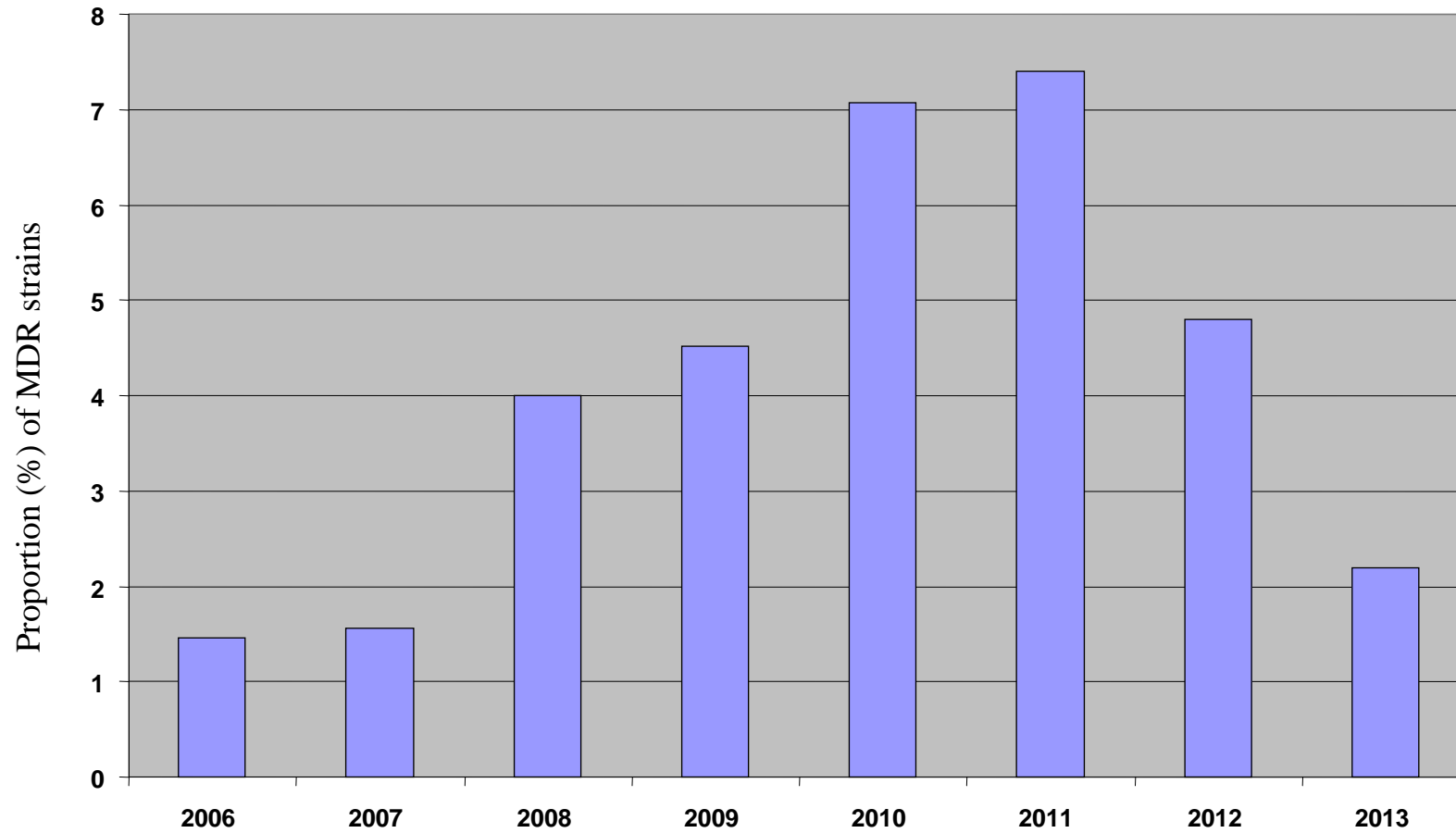
	Age ≥5 yr	Age <5 yr	Blood	ENT
Penicillin - R	1,0	0,0	0,0	1,9
Penicillin - I*	18	11	17	10
Ceftriaxone - R	0,0	0,0	0	0
Ceftriaxone - I	1,2	0,0	0	2,5
Erythromycin	17	21	13	22
Clindamycin	9	6	7	12
Doxycycline	13	9		15
Sulphamet-Trim.	16	15		14
Imipenem			0,0	
Levofloxacin			1	
Moxifloxacin			1	
Telithromycin			1	
<i>n</i>	514	178	202	157

*Should be interpreted (i) as S in pneumonia at the adult dose of 2 milj. IU x 6 and (ii) as R in meningitis

S. pneumoniae, susceptibility of the most common capsular serotypes to penicillin. HUSLAB material 2012.

Serotype	Proportion (%)	Number of strains	% SIR		
			PenS	PenI	PenR
14	15	31	32	65	3
22F	9	18	100	0	0
23F	8	16	87	13	0
3	7	15	73	27	0
	39 %				

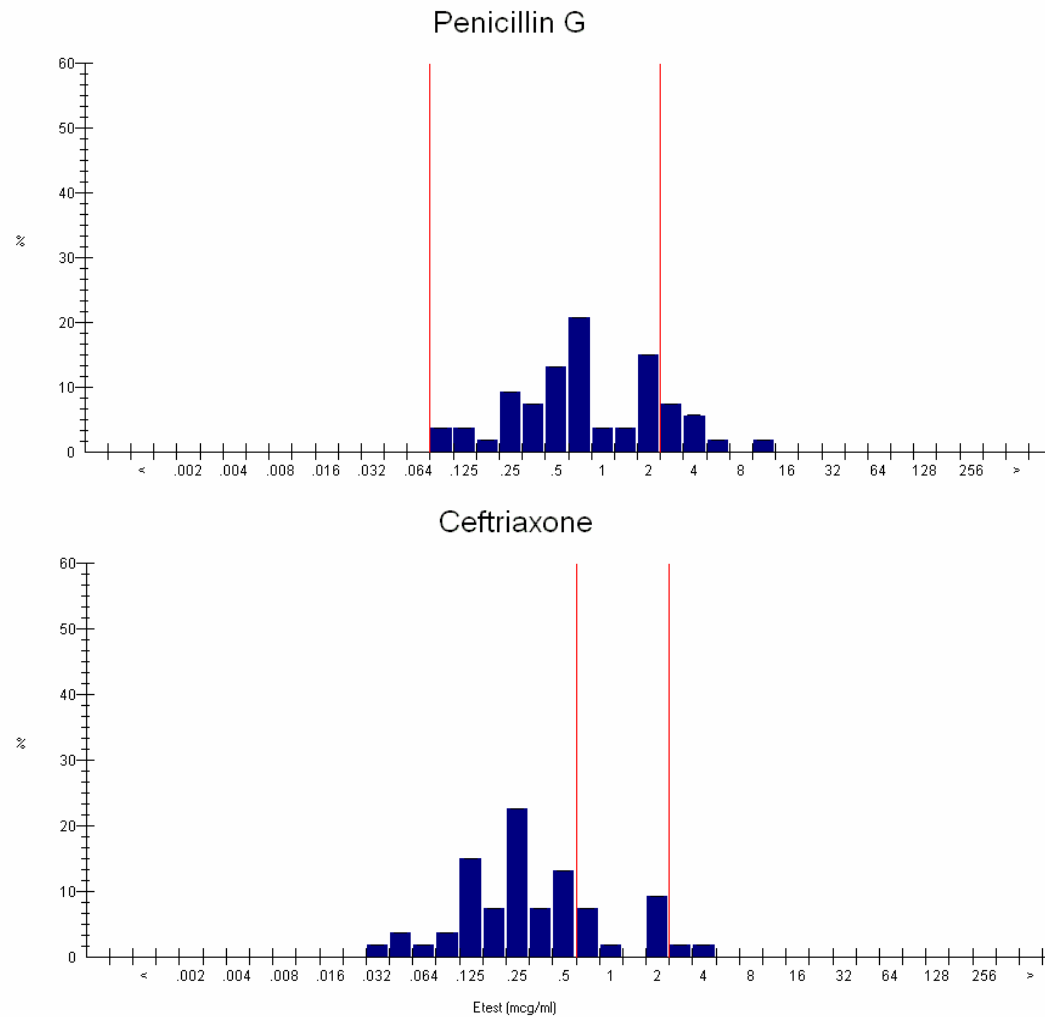
Multiresistant pneumococci* 2006 – 2013 (HUSLAB)



* Pen MIC > 0.064 µg/ml and non-susceptibility to Ery, Cli, Dox and SxT.
One isolate per patient.

Multiresistant pneumococci* 2012 - 2013 (HUSLAB)

MIC distribution for penicillin G and ceftriaxone ($n = 53$)



* Pen MIC > 0.064 $\mu\text{g/ml}$ and non-susceptibility to Ery, Cli, Dox and SxT.

***Streptococcus viridans* group, blood isolates 2013**

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

Penicillin -I	7
Penicillin -R	1
Ceftriaxone -I	0
Ceftriaxone -R	0
Erythromycin I+R	27
Clindamycin I+R	6
Gentamycin -high res.	1
Vancomycin	0

n = 106

Str. anginosus [milleri] group 2013 (%R+I)

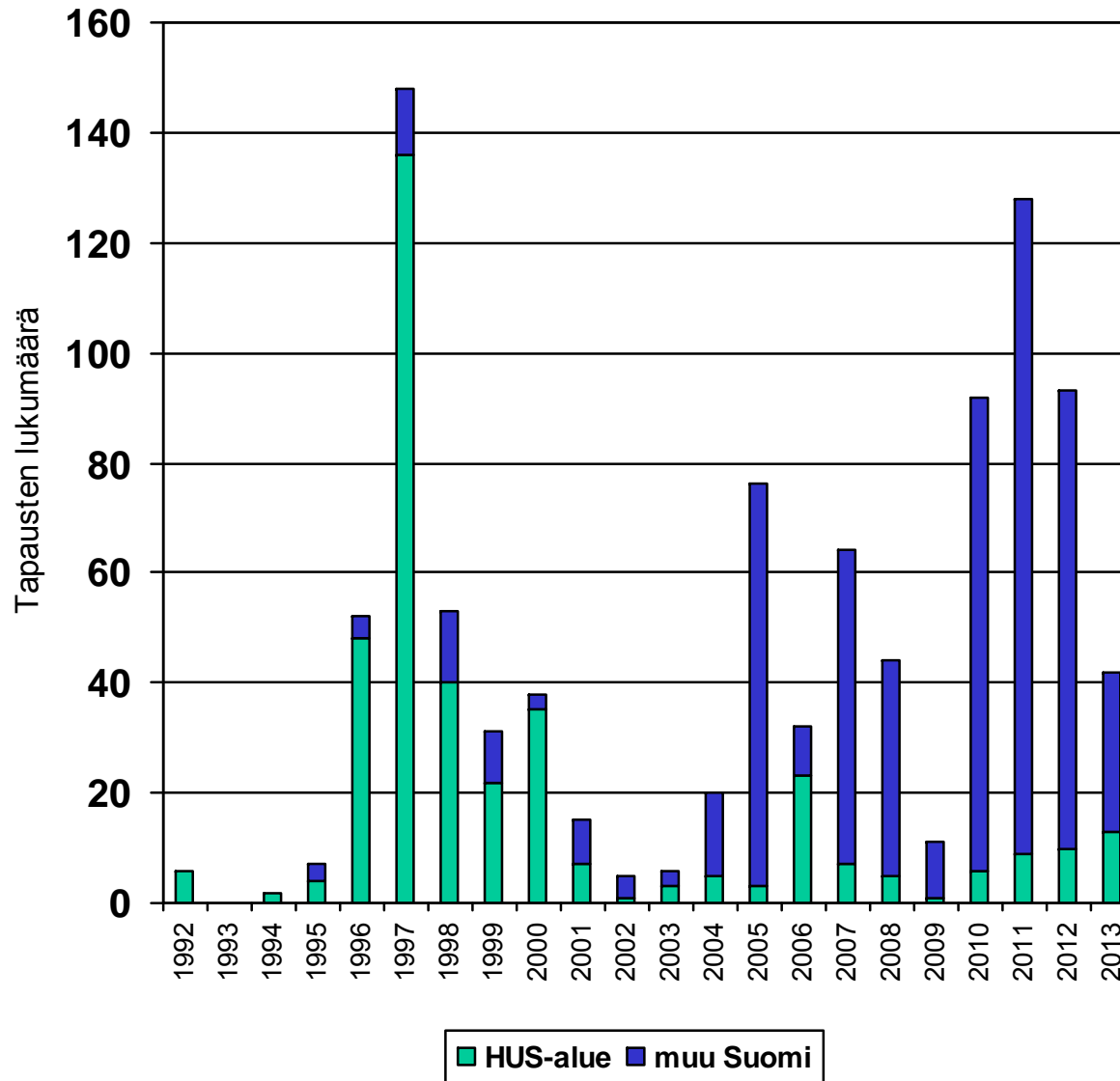
Pus and blood isolates, HUSLAB material from Helsinki and Uusimaa Districts.
One isolate per patient (the first isolate).

n = 920

Penicillin	1
Cephalospor. I gen.	0
Erythromycin	8
Clindamycin	7
Vancomycin	0

VRE cases in Finland 1992-2013

Green columns: Helsinki and Uusimaa District; blue columns: other parts of Finland



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E. faecalis and *E. faecium* 2013

%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	0,5	1	0	96	82	97
Imipenem	6	7		100	92	
Pip/taz	7	11		100	90	
Linezolid-I	0	0		0	0	
Linezolid-R	0,8	1		0	3	
Vancomycin	0	0	0	0,6	0	0
Gentam. (hi)		18			17	
Levofloxacin		49	23		94	97
Nitrofurantoin*			1			[89]
SuTri			19			92
n	921	120	3807	316	72	861

* Breakpoints apply for *E. faecalis* only.

Pseudomonas aeruginosa 2013 (%R+I)

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

	n	Ctaz	Mero	Pi-Tz	Tob	Ami	Cip
Meilahti	179	16	20	14	4	2	19
Töölö	170	8	21	11	1	1	15
Helsinki City hospitals	201	7	17	9	2	2	11
Jorvi Hospital	196	8	17	13	3	1	18
Peijas Hospital	76	15	22	15	1	1	17
Childrens´ Hospital	36	8	11	11	3	3	11
Uusimaa regional hospitals	217	9	14	12	5	4	17
Outpat. in Health Cntrs	747	2	9	3	2	2	9

Ps. aeruginosa, MDR strains*

*Nonsusceptibility at least to meropenem and ceftazidime. HUSLAB material from Helsinki and Uusimaa District. Screenings excluded.

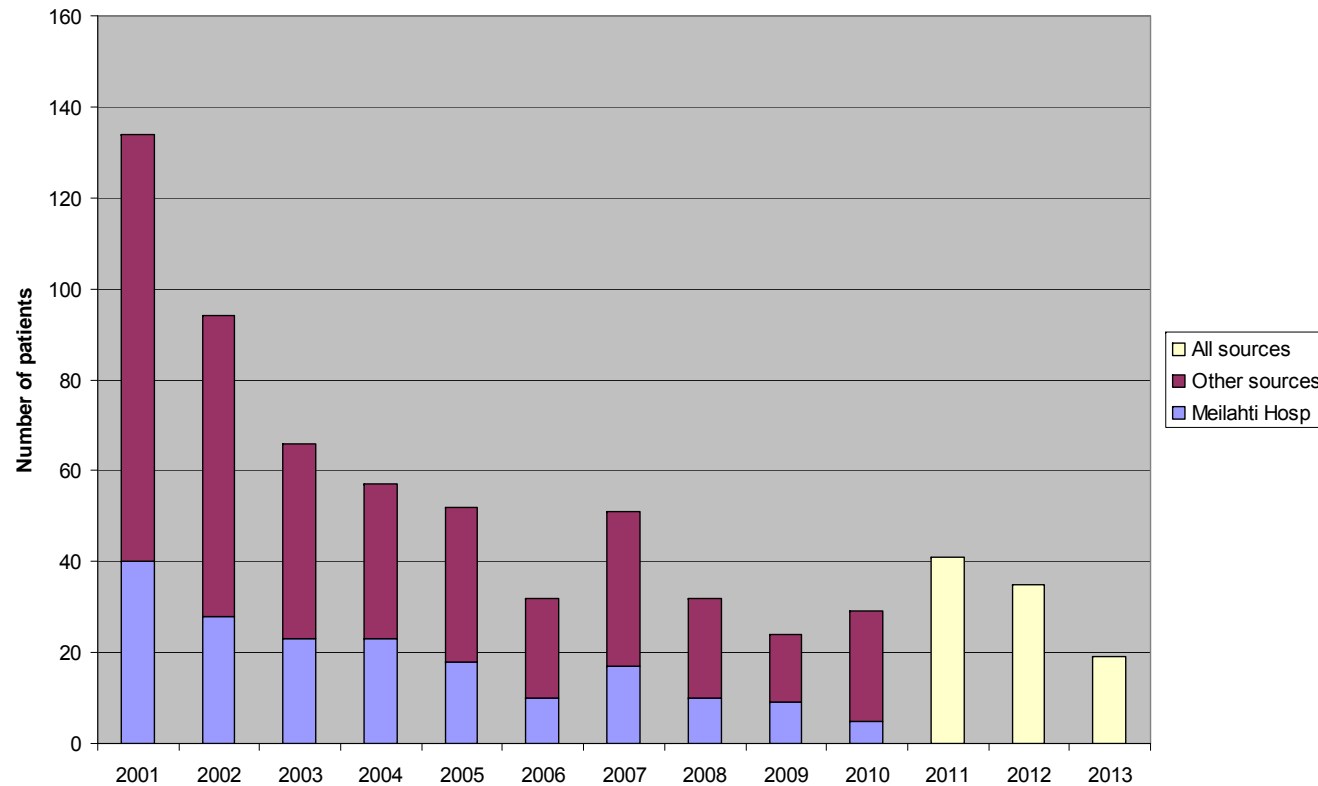
Year	Number of patients
2011	110
2012	83
2013	75

Most common resistance profiles of MDR-strains in 2013 (one per patient)

Number	Profile					
	Mero	Cefta	Tobra	Ami	Pip-tz	Cipro
28	R	R	R	S	S	R
16	R	R	R	S	S	S
8	R	R	R	R	R	R
8	R	R	R	S	R	R
4	R	R	R	S	S	R

Ps. aeruginosa, MDR strains* 2001-2013

* According to the definitions used in 2001 – 2010: nonsusceptibility to 1) meropenem and 2) tobramycin as well as 3) ceftazidime and/or piperacillin-tazobactam. HUSLAB material from Helsinki and Uusimaa District. Screenings excluded.



***Acinetobacter* spp. and *S. maltophilia* 2013 (%R+I)**

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

	n	Mero	Pi-Tz	Tob	Levo	SuTri
Acinetobacter	170	2	5	3	3	2
<i>S. maltophilia</i>	218	R	R	R	15	3

Acinetobacter spp.*, MDR strains 2011-2013

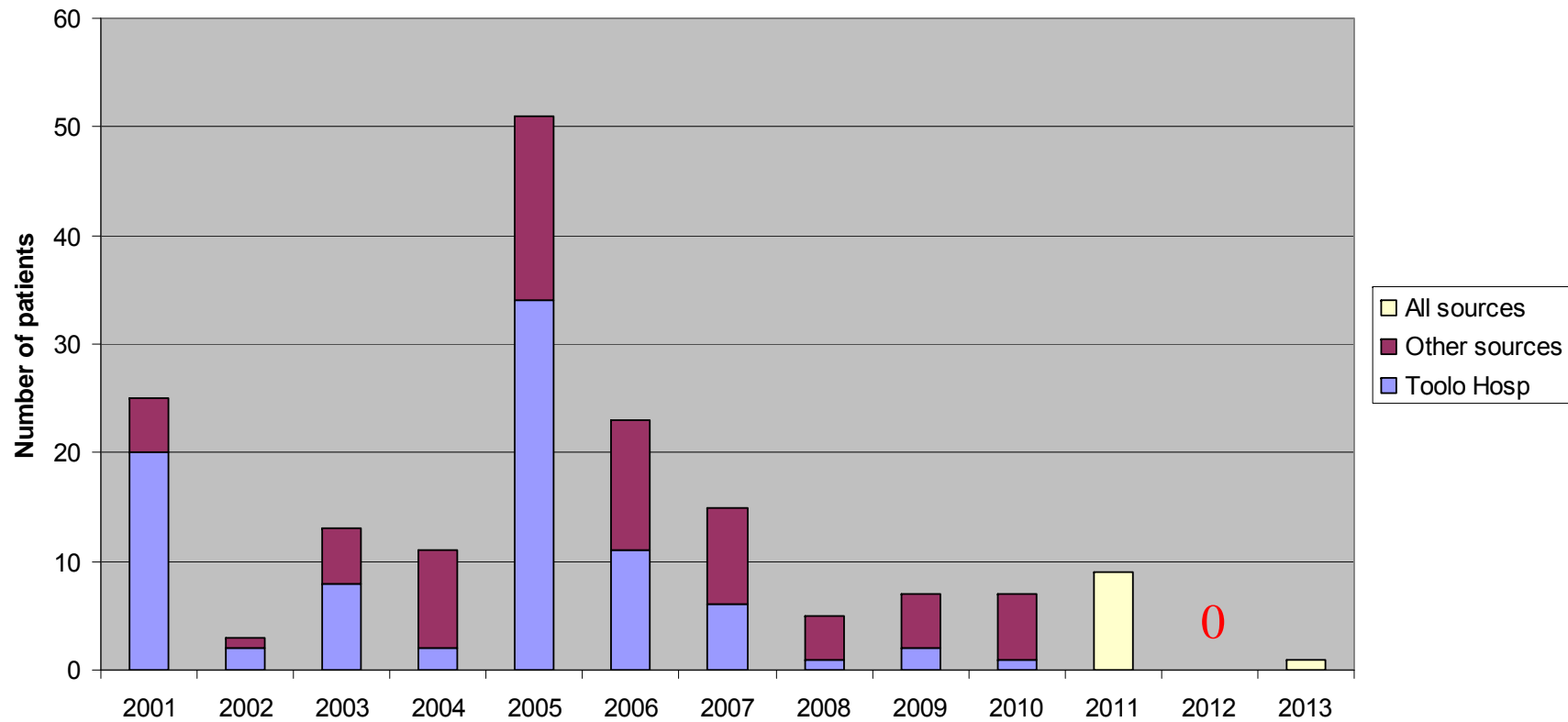
HUSLAB material from Helsinki and Uusimaa District. Screenings excluded.

* Nonsusceptibility to meropenem and at least two from the following: ceftazidime, fluoroquinolone, aminoglycoside, ampicillin/sulbactam. Screenings excluded.

Year	Number of patients
2011	14
2012	3
2013	3

Acinetobacter spp., MDR strains* 2001-2013

*According to the definition used in 2001-2010: nonsusceptibility to meropenem, tobramycin and piperacillin-tazobactam. HUSLAB material from Helsinki and Uusimaa District. Screenings excluded



Enterobacteriaceae 2013 (%R+I)

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

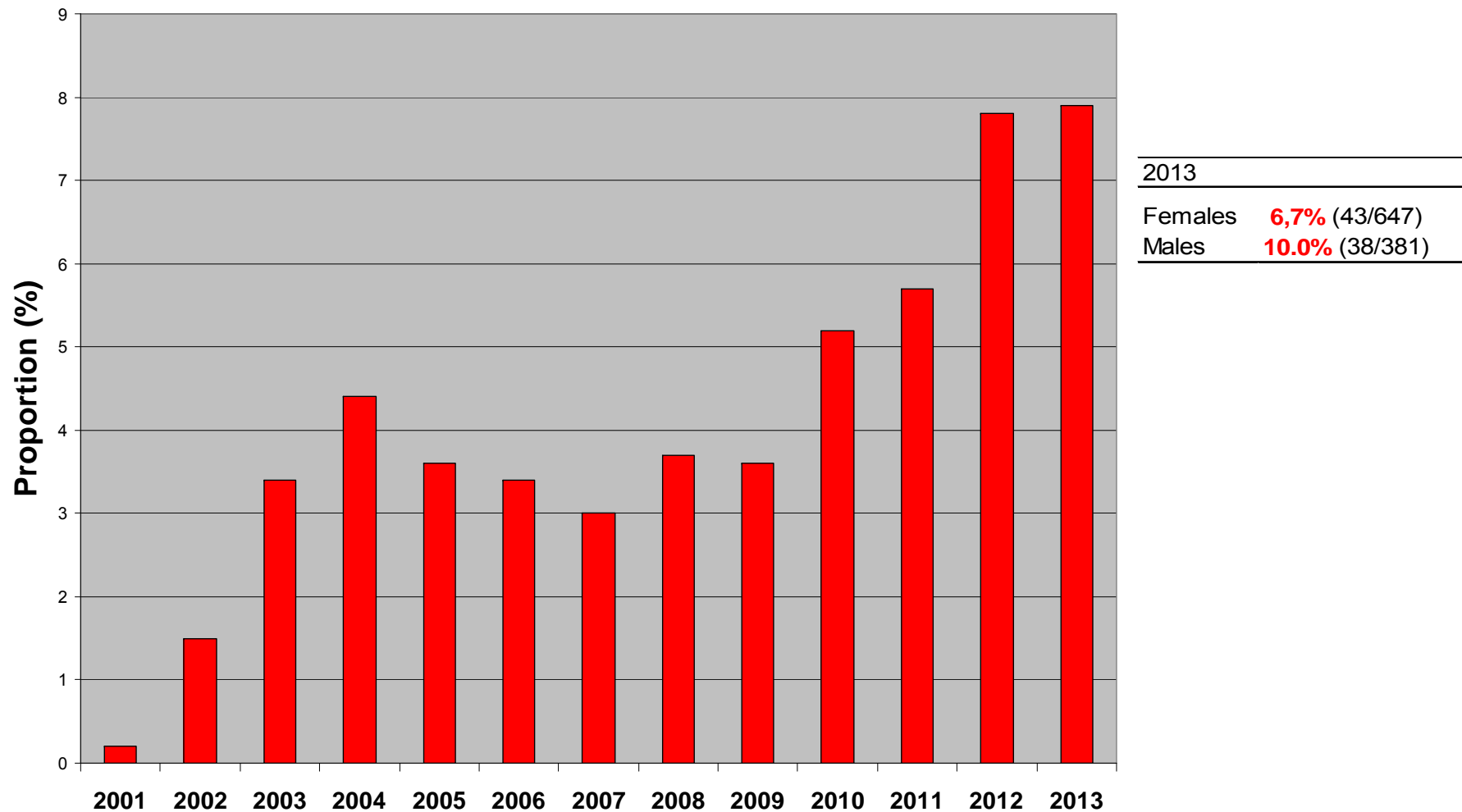
	n	Cfur	Ctax	Pi-Tz	Tob	Levo	Mero
E. coli	1601	11	9	9*	7	12	0,1
Kl. pneumoniae	347	8	3	3*	2	4	0,3
Kl. oxytoca	204	7	5	9	0	0	0
Proteus mirabilis	128	1	2	1	2	2	0
Ent. cloacae	434	(35)**	29**	29***	1	4	0,5
Citrob. spp.	212	(19)**	12**	12***	1	2	0
Serratia marc.	269	96**	10**	10***	6	5	0
Proteus vulgaris	56	98**	3**	3***	0	2	0
Morganella morg	89	90**	18**	18***	2	6	0

*: all ESBL strains reported here as nonsusceptible

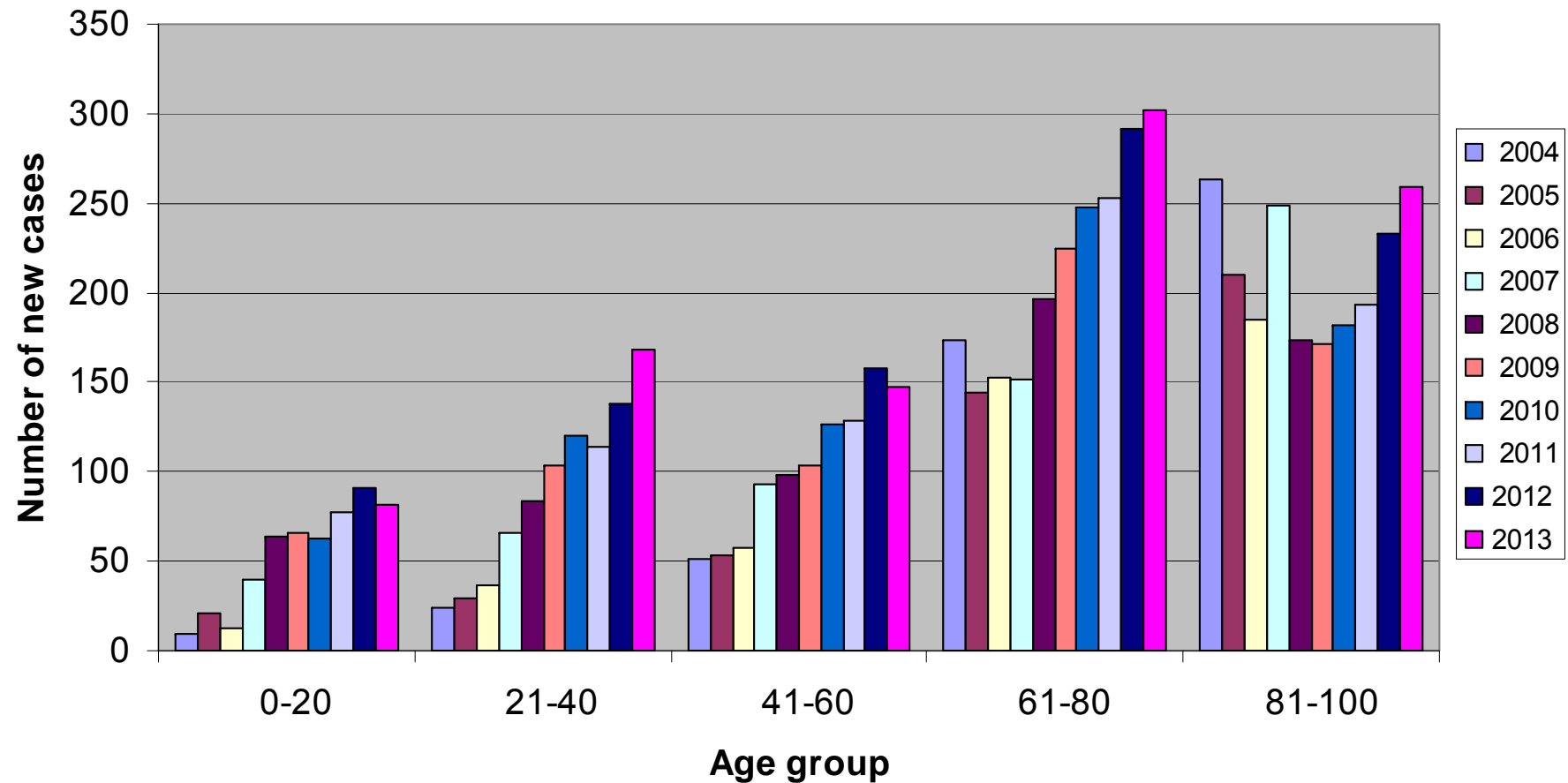
** : Resistance (due to *ampC* derepression mutation) develops easily during therapy to cefuroxime as well as to cefotaxime and other III gen. cephalosporins, hence cephalosporin monotherapy not recommended.

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

Frequency of *E. coli* ESBL among all *E. coli* blood isolates. HUSLAB material 2001- 2013



E. coli ESBL 2004 – 2013,
number of new cases by age categories in Huslab material,
screening excluded

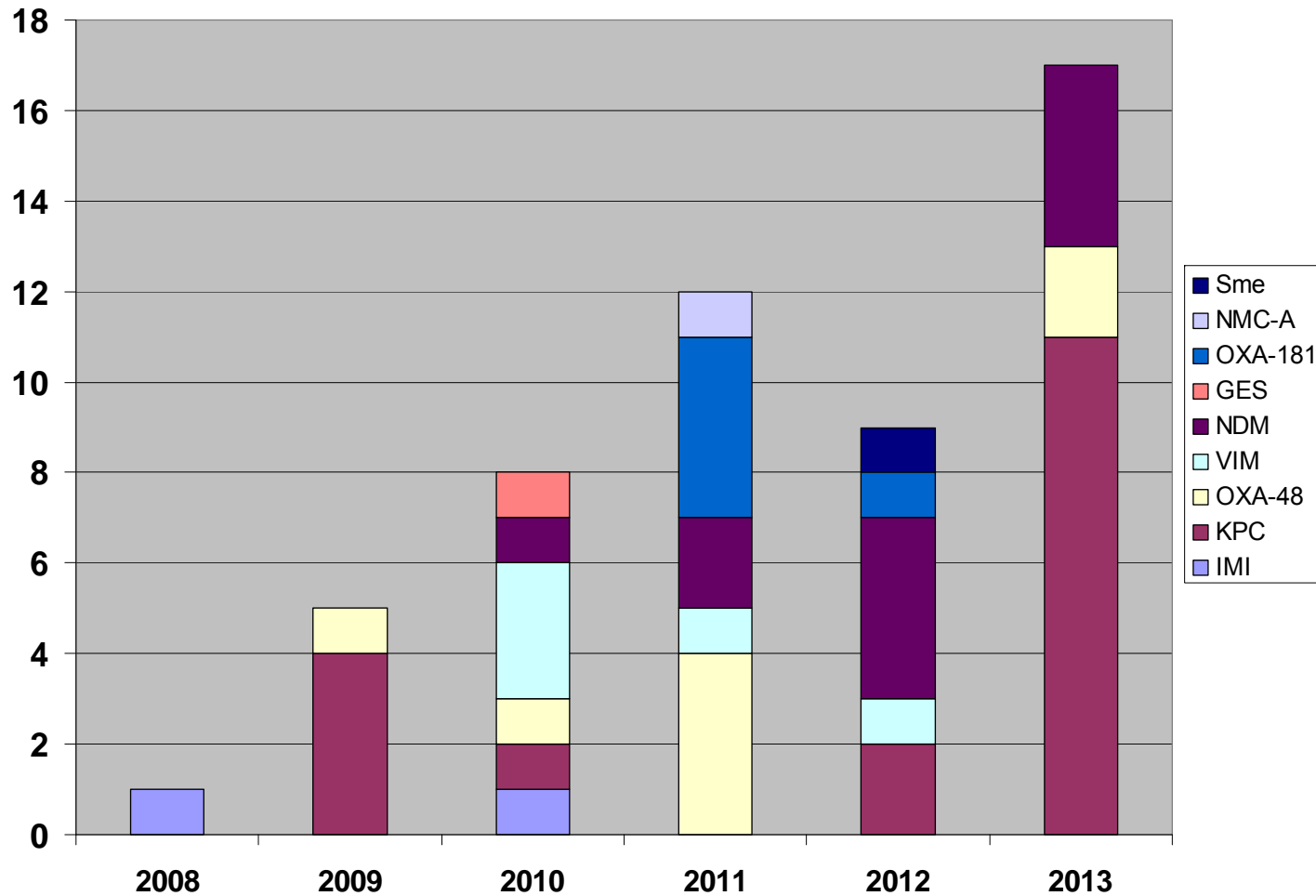


ESBL strains, resistance to non-betalactams and carbapenems 2013

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

	E. coli
Ciprofloxacin	70
Tobramycin	44
Sulphatrimetoprim	64
Trimetoprim	66
Nitrofurantoin	4,5
Fosfomycin	3
Meropenem	0,2
Ertapenem	3
<i>n</i>	1197

Carbapenemase-producing *Enterobacteriaceae* (CPE) in HUSLAB material 2008-2013 (one per patient)



All KPC cases in 2013 were from one hospital epidemic.

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Enterobacteriaceae, urine isolates 2013 (%R)

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

	E. coli	K. pneum.	P. mirabilis	Enterobacter spp.	Citrobacter spp.	Other*
Nitrofurantoin	1	14	100	21	5	90
Mecillinam**	4	6	6	[20]	[9]	[70]
Cephalexin	8	4	5	87	48	90
Cefuroxime	7	4	1	27	14	79
Ciprofloxacin	10	2	2	1	2	4
Trimetoprim	23	22	41	10	11	17
n	24494	2623	863	902	761	568

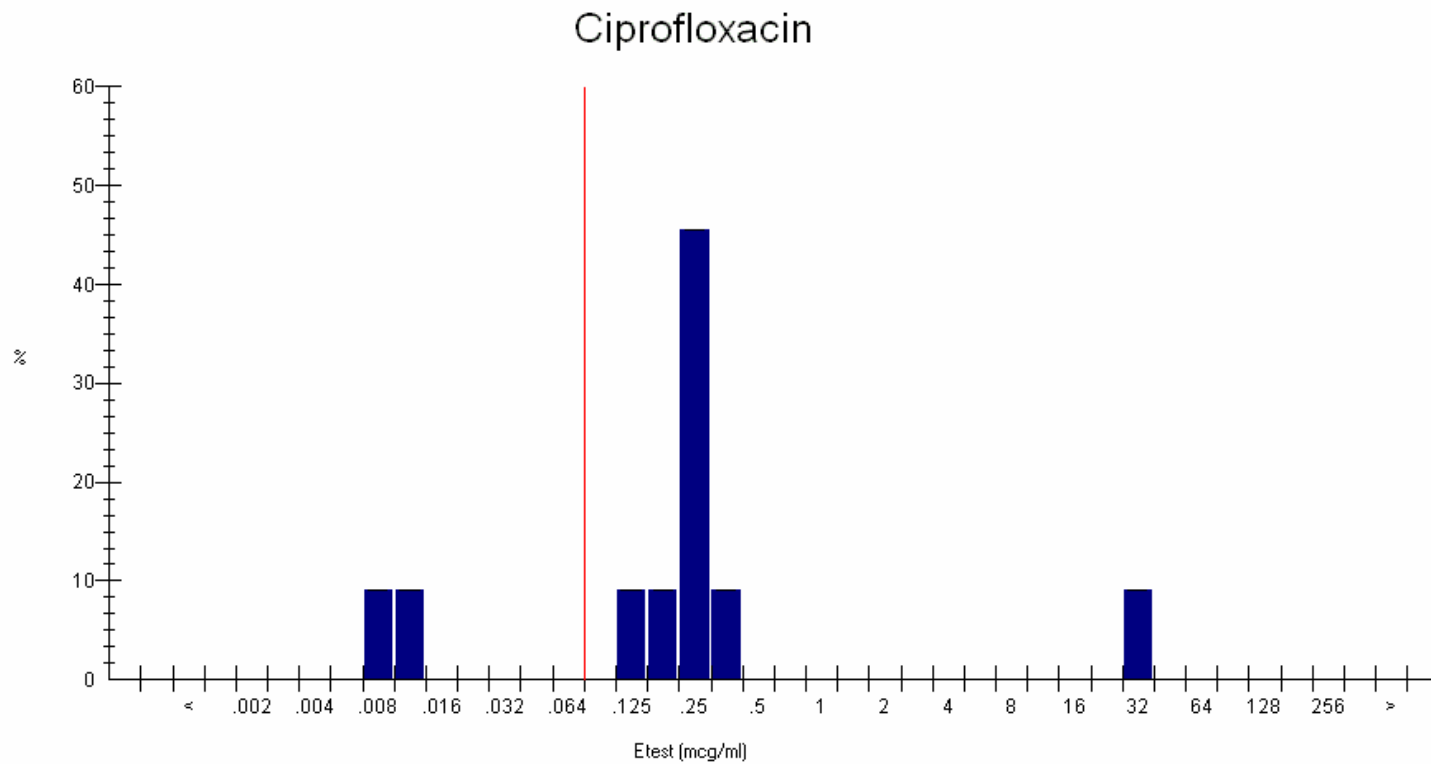
* Indole-positive *Proteus* spp, *Morganella* spp, *Providencia* spp., *Serratia* spp.

** Breakpoints apply to *E. coli*, *K. pneumoniae* and *P. mirabilis*, only.

Salmonella typhi 2009 -2013, susceptibility to ciprofloxacin

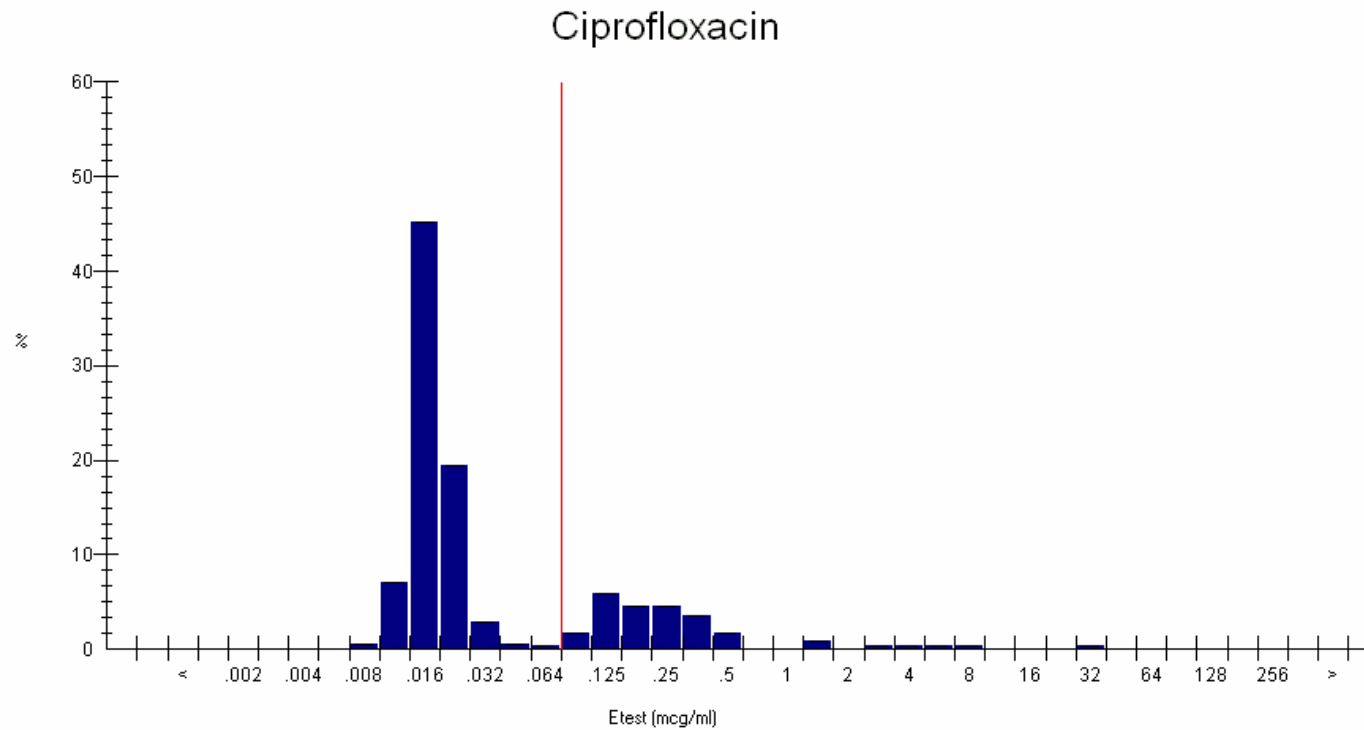
HUSLAB material from Helsinki and Uusimaa Districts.

One isolate per patient (the first isolate), $n = 12$



Salmonella spp 2013, susceptibility to ciprofloxacin

HUSLAB material from Helsinki and Uusimaa Districts.
One isolate per patient (the first isolate), $n = 391$



Salmonella ESBL, HUSLAB material 2011 – 2013

Year	Proportion (%) of ESBL strains	Total number of strains studied*
2011	2,6	389
2012	1,9	432
2013	1,8	391

* One per patient

Shigella spp. 2013 (%R+I)

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

n = 34

Ampicillin	27
Ceftriaxone*	3
Ciprofloxacin	29
Sulphatrimetoprim	79
Doxycycline	79

* ESBL

H. influenzae & *M. catarrhalis* 2013 (%R+I)

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

	H. influenzae	M. catarrh.
Ampicillin	20	100
Amoxycill-clavul.	1	0
Cefuroxime	3	0
Doxycycline	3	1
Ciprofloxacin	0	0
Sulphameth-trim.	31	5
Azithromycin	95*	6
n	583	263

* EUCAST breakpoint sets most isolates to category I and very few isolates to S.

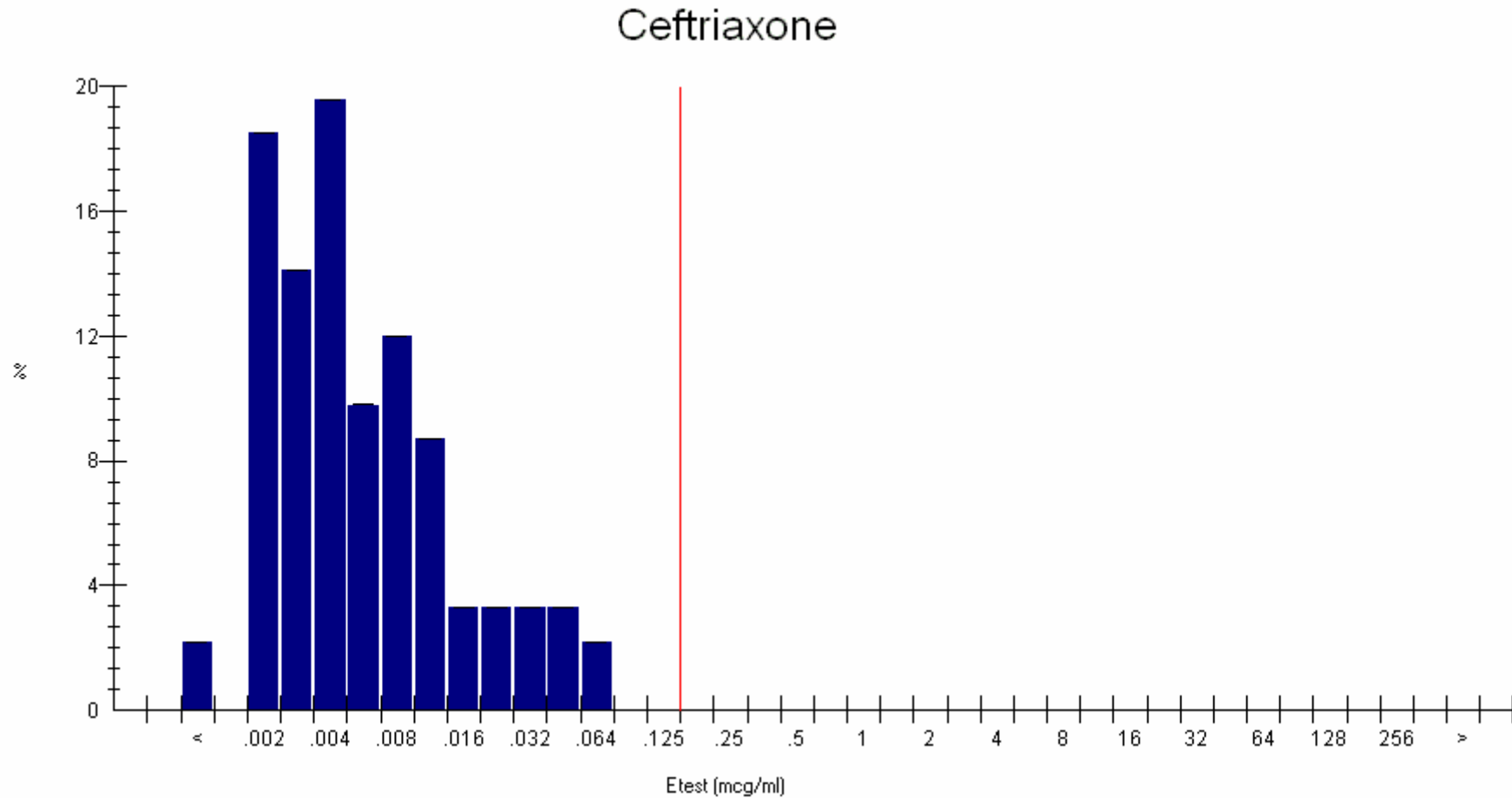
Neisseria gonorrhoeae, resistance to ciprofloxacin 2001-2013

HUSLAB material from Helsinki and Uusimaa Districts (2013, $n = 93$)



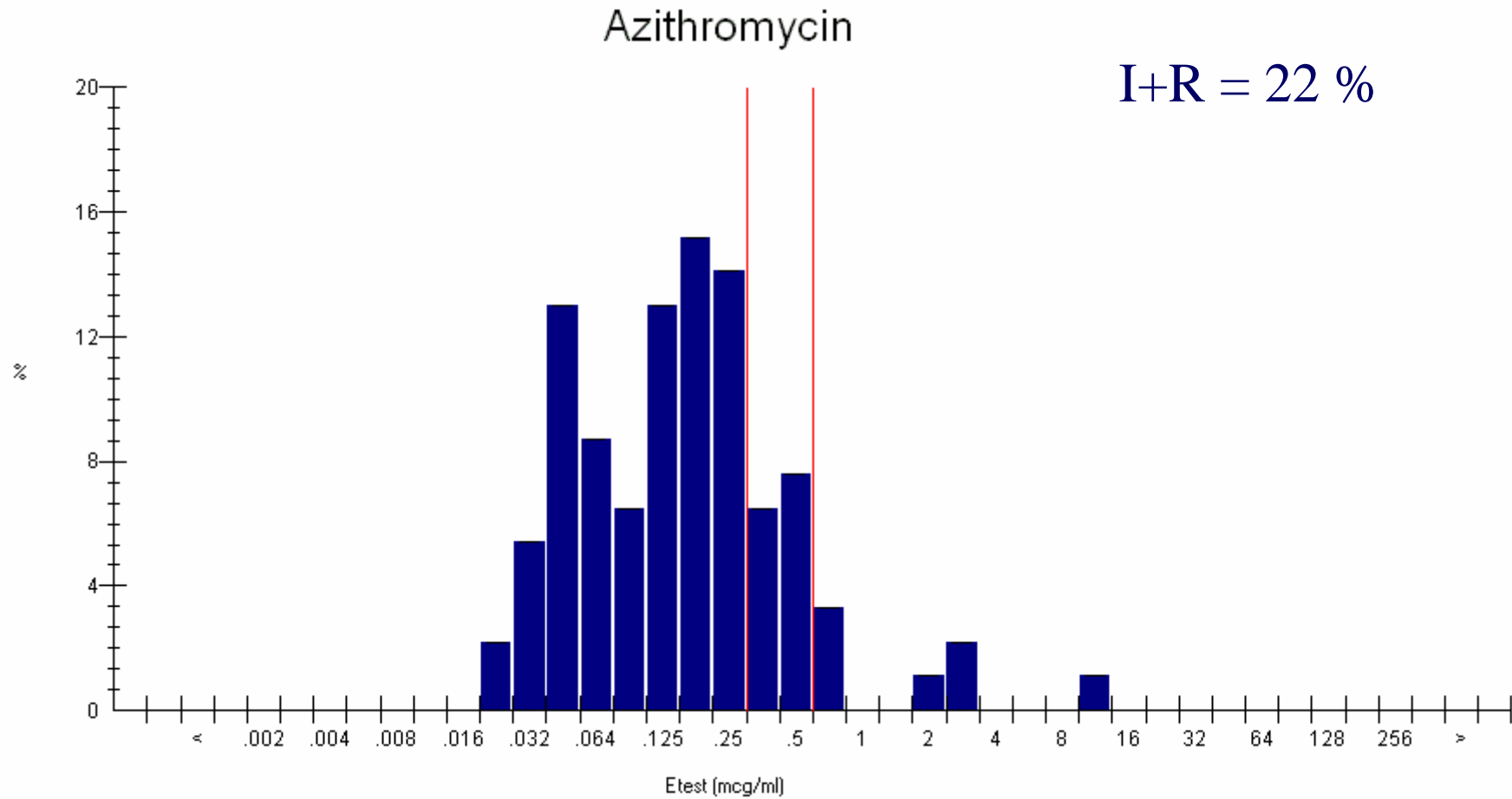
Neisseria gonorrhoeae, MIC of ceftriaxone 2013

HUSLAB material from Helsinki and Uusimaa Districts ($n = 92$)



Neisseria gonorrhoeae, MIC of azithromycin 2013

HUSLAB material from Helsinki and Uusimaa Districts ($n = 92$)



Neisseria meningitidis 2010 - 2013 (%R+I)

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

Penicillin-I	14
Penicillin-R	2
Ceftriaxone	0
Meropenem	0
Ciprofloxacin	0
Chloramphenicol	0
n	50

***Bacteroides fragilis* group 2013 (%R+I)**

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

n = 1923

Metronidazole	0
Piperacillin-tazobactam	2
Imipenem	0
Clindamycin	51
Doxycycline	35
Penicillin G	100