

HUSRES Annual Report 2014

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www.huslab.fi

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The basis of this HUSRES 2014 report is the HUSLAB/Whonet database 2014, which contains susceptibility data on more than 190.000 microbes. EUCAST 2014 clinical breakpoints for susceptibility interpretations are mainly used.

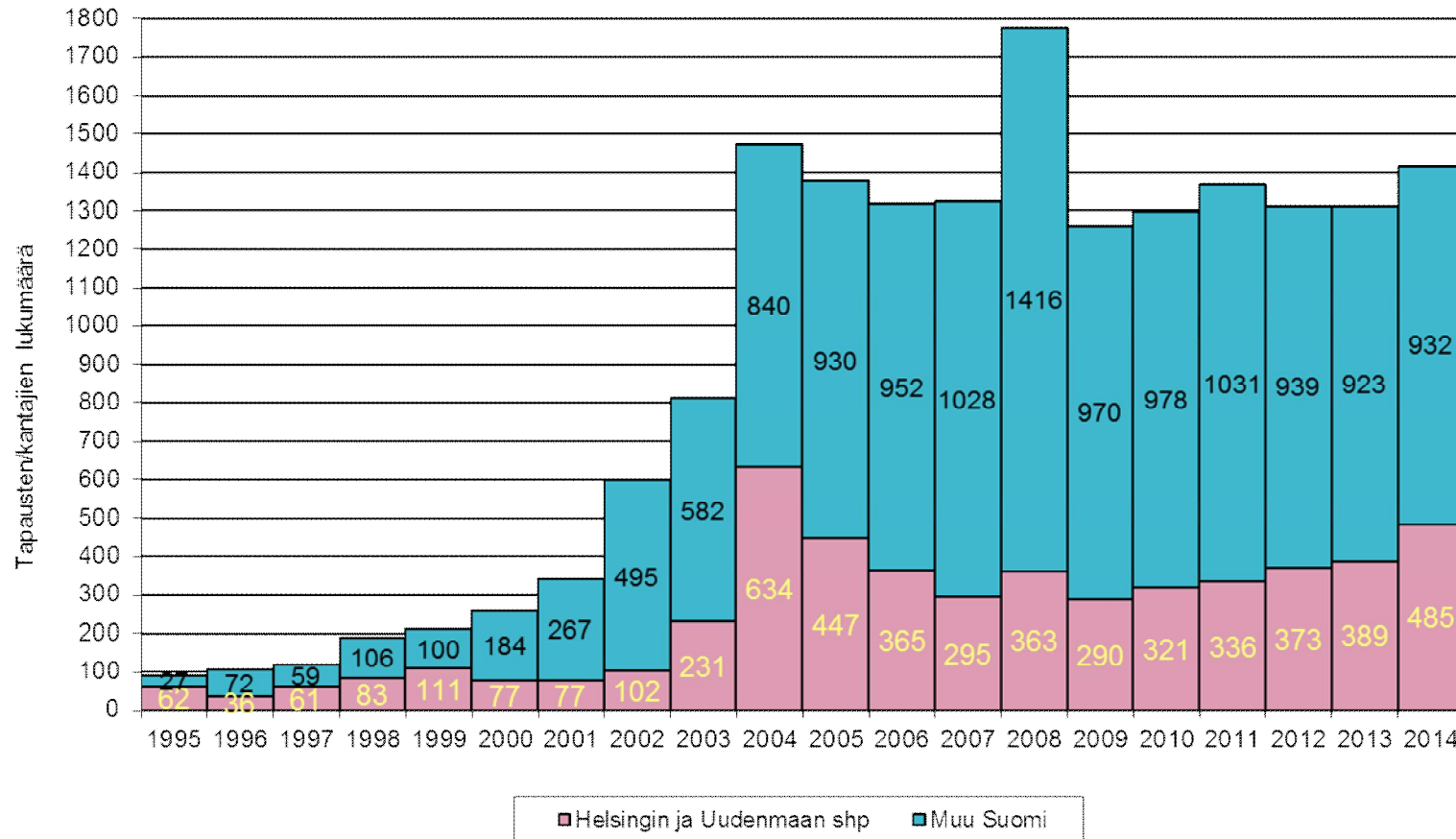
The isolates originate from patients of Helsinki University Central Hospital, of other hospitals in Helsinki - Uusimaa region, and of outpatient health centers.

HUSRES 2014 report contains data on approx. 30 clinically most important bacterial species/groups.

Previous annual reports from 2000 can be found also at www.huslab.fi

MRSA cases in Finland 1995 – 2014

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



Source: National Institute for Health and Welfare

Staphylococcus aureus 2014 (%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
HUCH	3040	3	7	6	3	1	8	4	0	0
Jorvi Hospital	806	3	7	5	3	1	8	4	1	0
Peijas Hospital	402	4	7	5	3	0	8	3	0	0
Hyvinkää Hosp	399	2	4	4	1	1	6	2	0	0
Helsinki City H	671	8	10	7	5	1	6	4	0	0
Outpatients	4316	3	7	6	2		8			

Coagulase-negative staphylococci 2014 (%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	1331	67	55	44	54	13	63	17	20	0	35
St. haemolyticus	74	97	84	41	84	7	37	20	22	0	74
St. lugdunensis	246	1	8	7	1	1	10	7	1	0	1

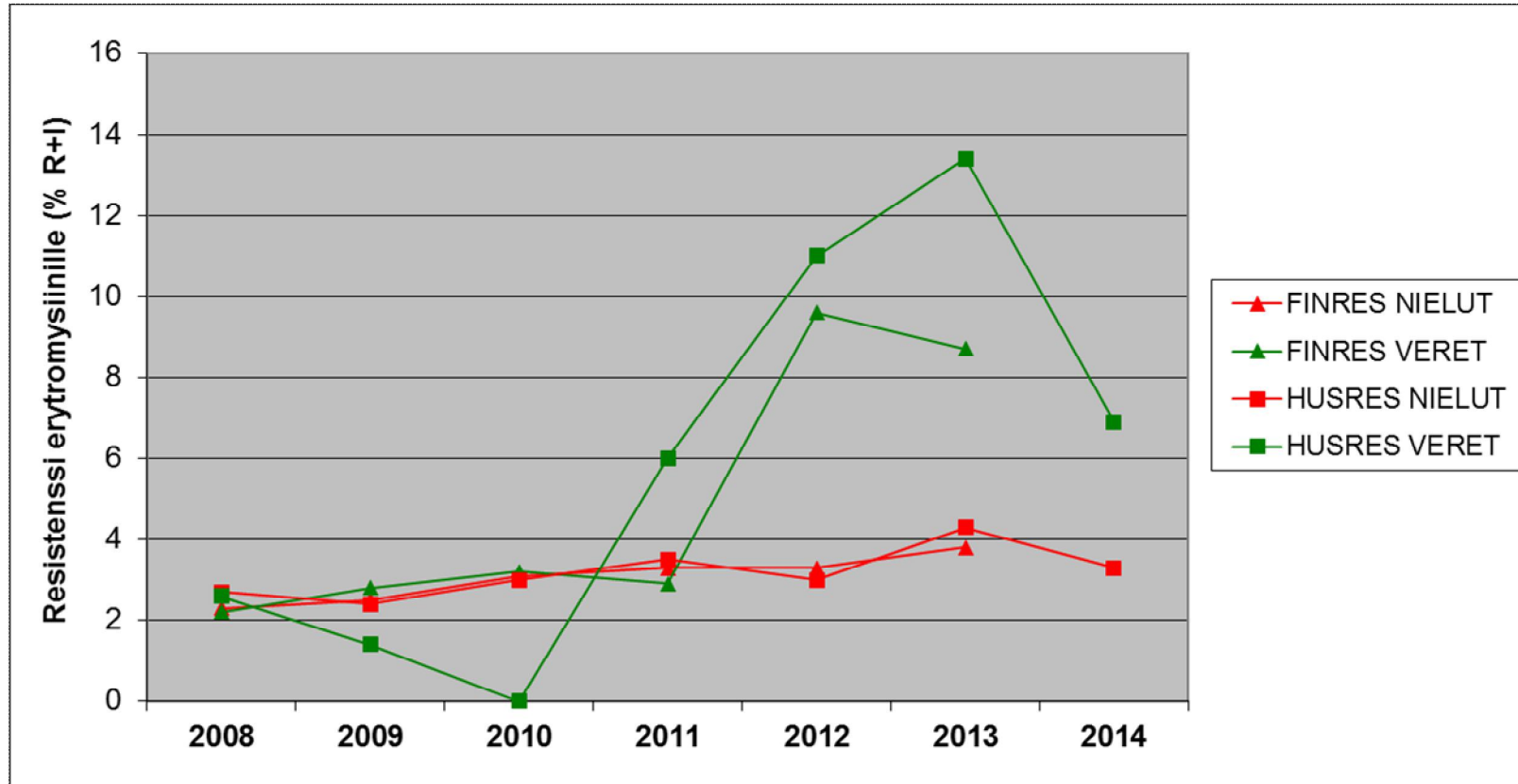
Beta-hemolytic streptococci 2014 (%R+I)

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	3	15	8	13
Clindamycin	3	14	8	12
n	10523	6268	1612	4140

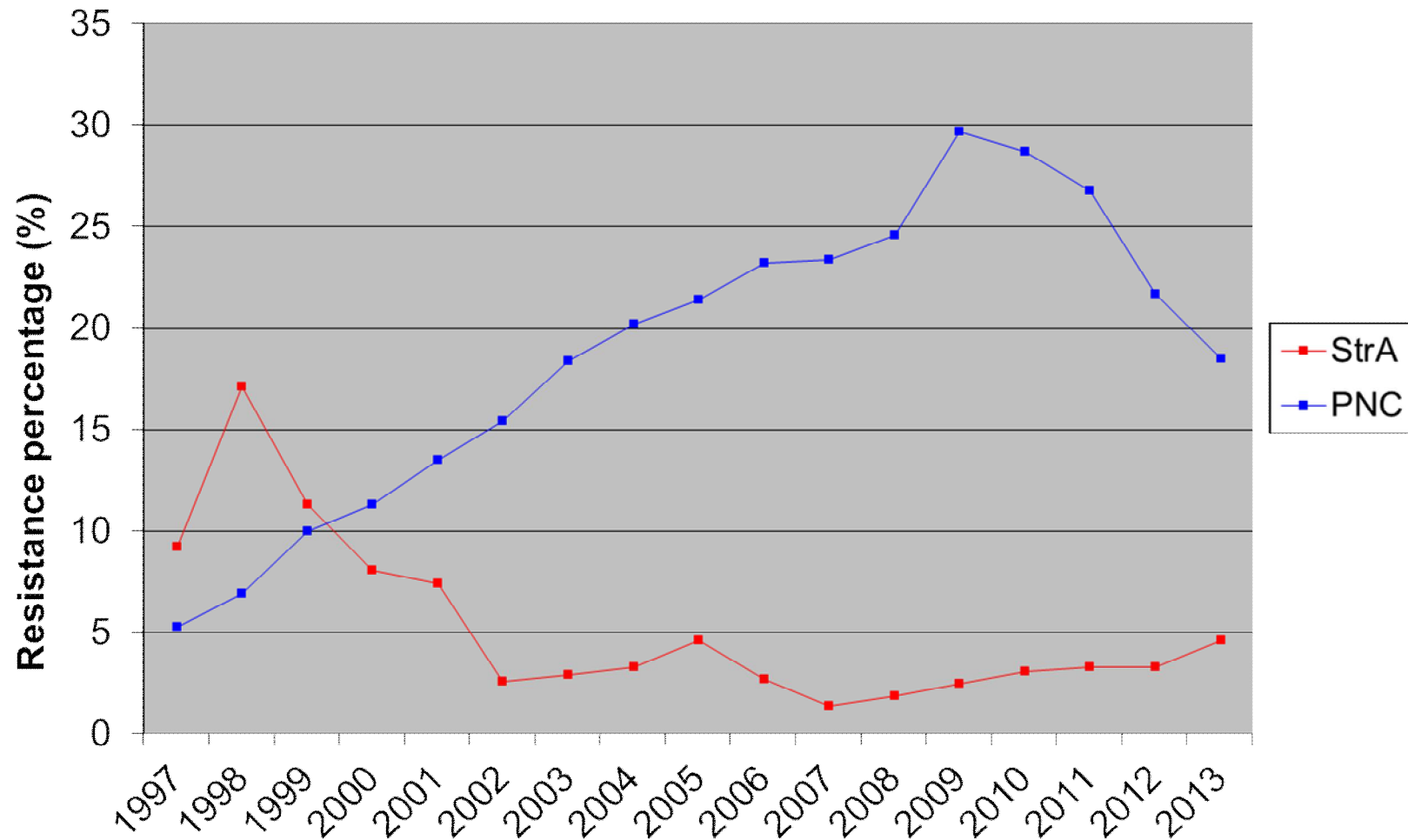
Group G: *S. dysgalactiae* spp. *equisimilis* group G isolates

S. pyogenes, erythromycin resistance (%R+I) in throat (red) and blood (green) isolates. Material from HUSLAB (squares) and from nationwide Finres data collection (triangles).



Source: HUSLAB and Finres 2013 <http://urn.fi/URN:ISBN:978-952-302-359-8>

S. pneumoniae and *S. pyogenes*, nonsusceptibility to erythromycin (%R+I) in 1997-2013 in Finland



Source :Finres 2013 <http://urn.fi/URN:ISBN:978-952-302-359-8>

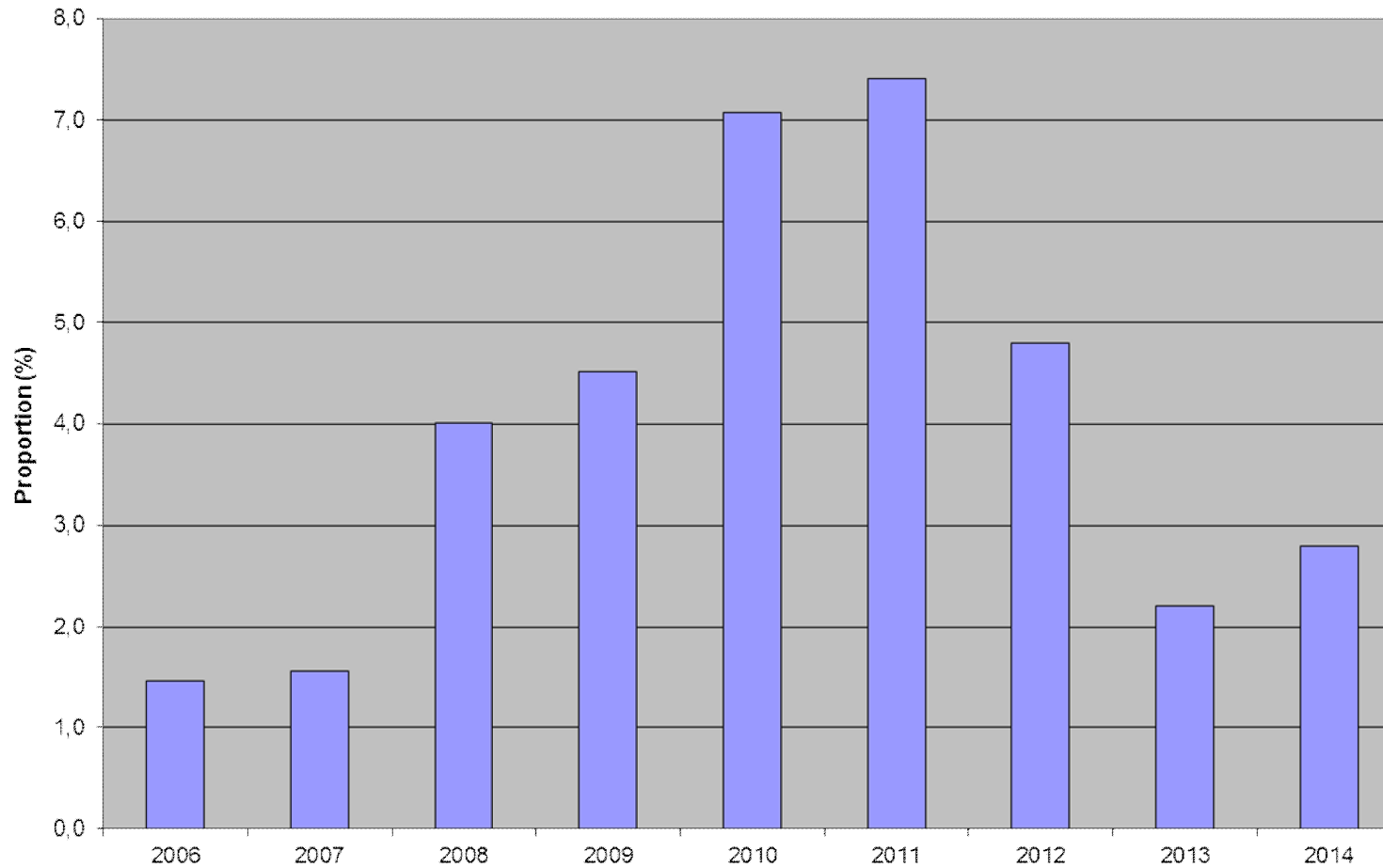
Streptococcus pneumoniae 2014 (%R+I)

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

	Age ≥5 yr	Age <5 yr	Blood	Pus
Penicillin - R	0,4	1,6	0	0,9
Penicillin - I*	16	15	17	14
Ceftriaxone - R	0	0	0	0
Ceftriaxone - I	1,9	1,6	0,6	2,3
Erythromycin	15	17	10	17
Clindamycin	10	8	6	10
Doxycycline	11	8		10
Sulphamet-Trim.	17	18		18
Imipenem			0	
Levofloxacin			1,2	
Moxifloxacin			1,8	
Telithromycin			1,2	
<i>n</i>	466	127	167	435

*The I category should be interpreted as S in pneumonia at the adult dose of 2 milj. IU x 6 and as R in meningitis.

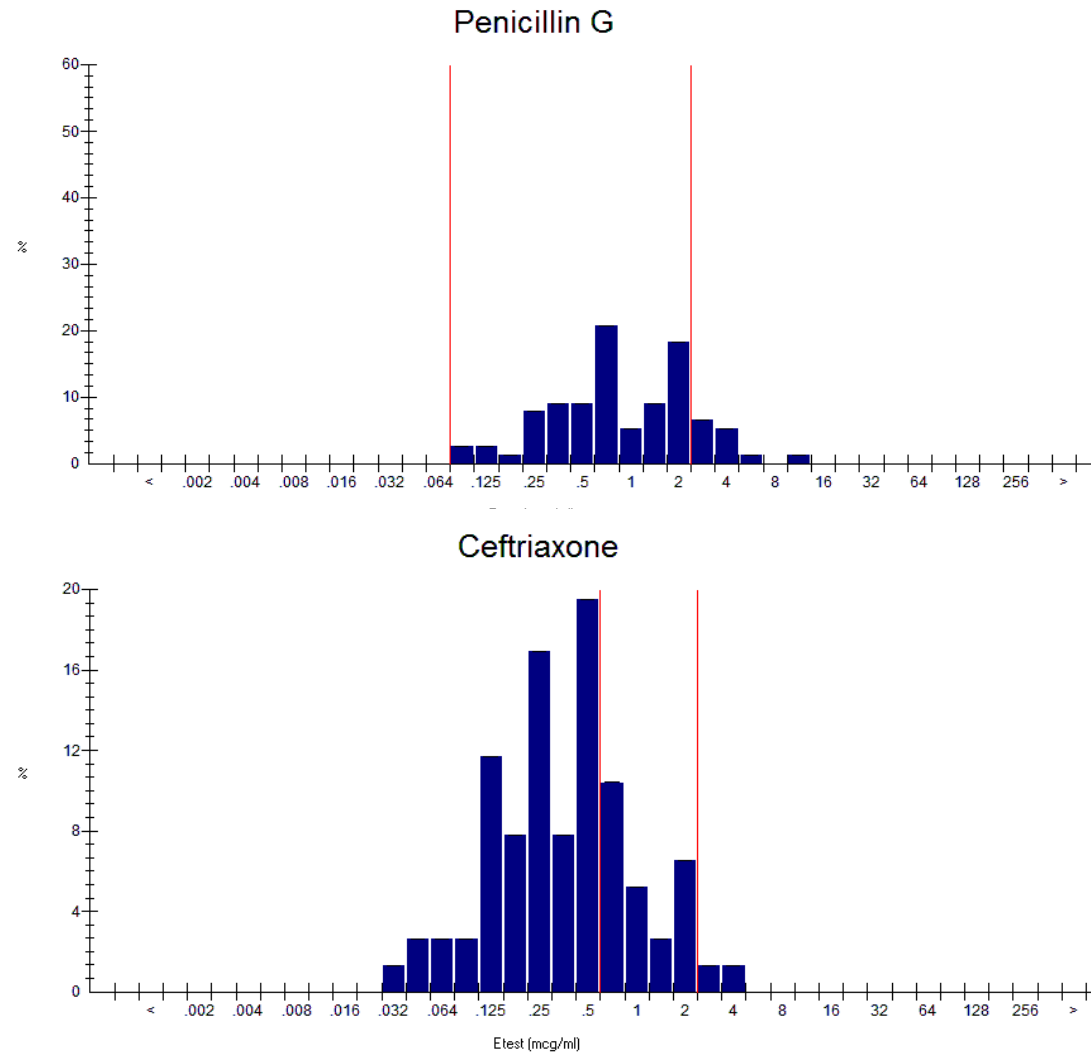
Multiresistant pneumococci* 2006 – 2014 (HUSLAB)



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

Multiresistant pneumococci* 2012 - 2014 (HUSLAB)

MIC distribution for penicillin G and ceftriaxone ($n = 77$)



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

***Streptococcus viridans* group, blood isolates 2014**

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

Penicillin -I	13
Penicillin -R	0
Ceftriaxone R	2
Erythromycin I+R	32
Clindamycin I+R	4
Gentamycin (high) R	0
Vancomycin	0

n = 93

Str. anginosus [milleri] group 2014 (%R+I)

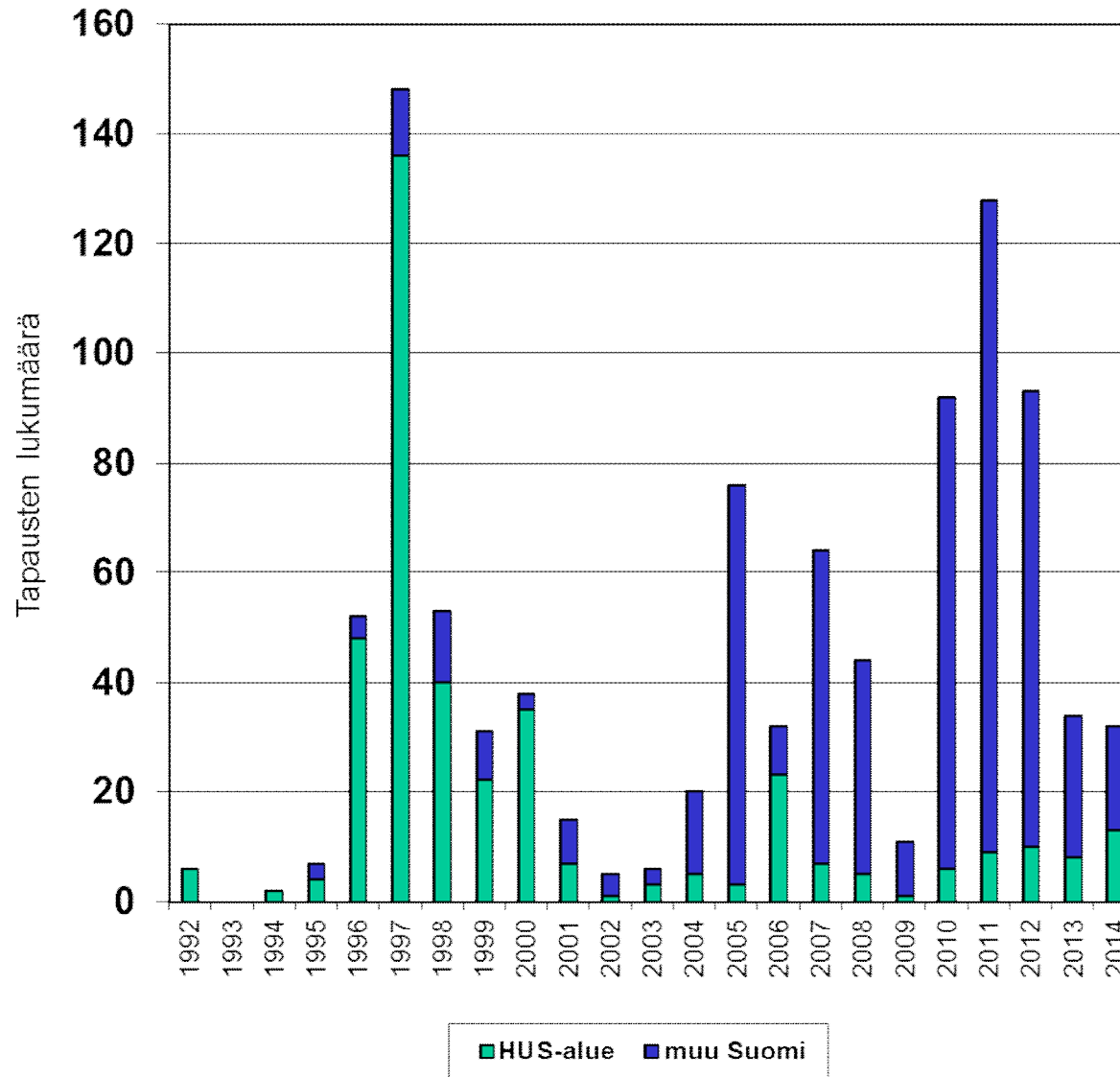
Pus and blood isolates, HUSLAB material from Helsinki and Uusimaa Districts.
One isolate per patient (the first isolate).

n = 995

Penicillin	0
Cephalospor. I gen.	0
Erythromycin	11
Clindamycin	9
Vancomycin	0

VRE cases in Finland 1992-2014

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



E. faecalis and *E. faecium* 2014

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

	E. faecalis			E. faecium		
	pus	blood	urine	pus	blood	urine
Ampicillin	2	0	0,2	84	78	95
Imipenem	2	2		87	82	
Pip/taz*	3	6		88	85	
Linezolid	0	0		0	0	
Vancomycin	0	0	0	0	0	0
Gentam. (high)		20			7	
Levofloxacin**			56			97
Nitrofurantoin***			0,2			[83]
SuTri			15			88
n	836	136	3864	313	60	630

*Used breakpoints: MIC $S \leq 8$, $R > 16$, zone diameter $S \geq 18$ mm, $R < 15$ mm. **Used breakpoints: $S \geq 22$ mm, $R < 19$ mm*** Breakpoints apply for *E. faecalis* only.

Pseudomonas aeruginosa 2014 (%R+I)

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

	n	Ctaz	Mero	Pi-Tz	Tob	Ami	Cip
Meilahti	206	8	18	8	2	2	13
Töölö	155	7	16	7	1	1	17
Helsinki City hospitals	135	6	19	6	0	0	6
Jorvi Hospital	201	10	16	12	4	1	19
Peijas Hospital	89	17	10	7	2	3	14
Childrens´ Hospital	25	4	8	8	0	0	4
Uusimaa regional hospitals	207	9	13	7	2	2	18
Outpat. in Health Centers	803	4	7	3	1	1	8

Ps. aeruginosa, MDR*

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

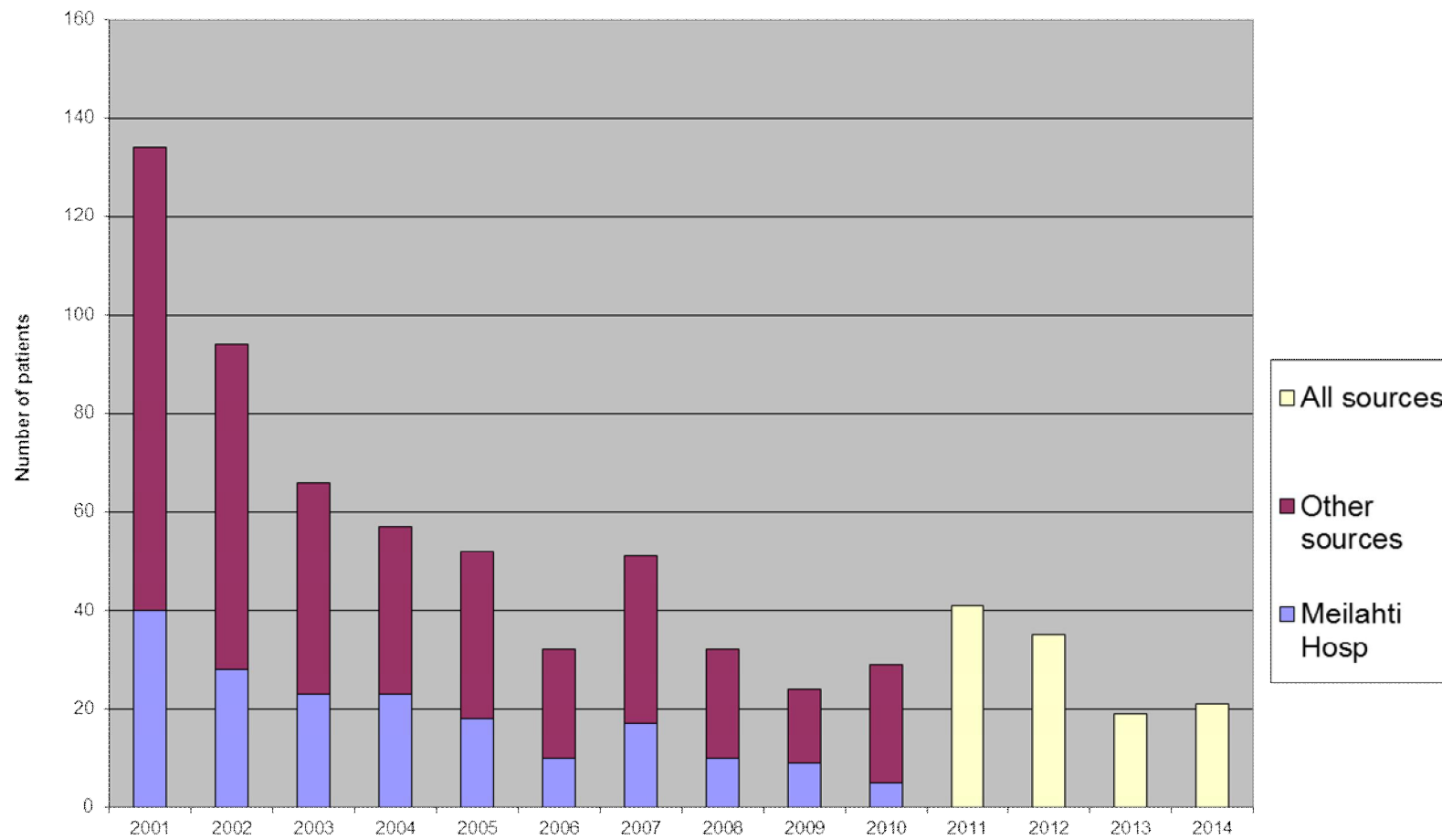
Year	Number of patients
2011	110
2012	83
2013	75
2014	56

Most common resistance profiles of MDR isolates in 2014 (one per patient)

Number	Profile					
	Mero	Cefta	Tobra	Ami	Pip-tz	Cipro
22	R	R	S	S	R	R
14	R	R	S	S	R	S
10	R	R	R	S	R	R
3	R	R	R	R	R	R

Ps. aeruginosa, MDR* 2001-2014

* 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* 2014 (%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	336	5	8	5	6	8
S. maltophilia	292	R	R	R	10	3

***Acinetobacter spp.*, MDR*, new cases 2011-2014**

HUSLAB material from Helsinki and Uusimaa District.
One per patient (the first isolate only). Screenings excluded.

* Nonsusceptibility to meropenem and nonsusceptibility to at least two of the following: ceftazidime, fluoroquinolone, aminoglycoside, ampicillin/sulbactam.

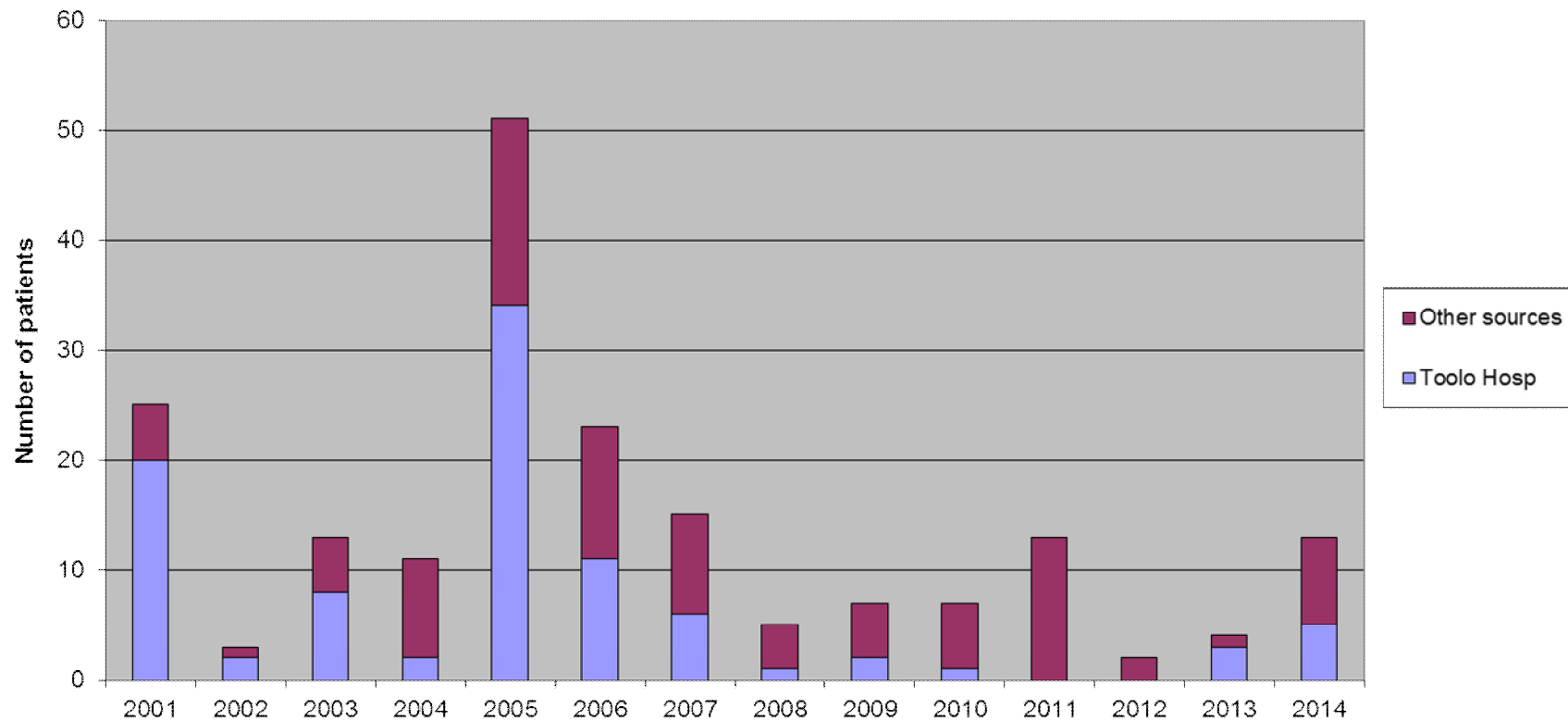
Year	Number of patients
2011	13
2012	2
2013	4
2014	13

Acinetobacter spp., MDR* isolates 2001-2014

HUSLAB material from Helsinki and Uusimaa District.

One per patient (the first isolate only). Screenings excluded.

*Definition used in 2001-2010: nonsusceptibility to meropenem, tobramycin and piperacillin-tazobactam. Onwards 2011: Nonsusceptibility to meropenem and nonsusceptibility to at least two of the following: ceftazidime, fluoroquinolone, aminoglycoside, ampicillin/sulbactam.



Enterobacteriaceae 2014 (%R+I)

Pus and blood isolates of Helsinki University Central Hospital.

One isolate per patient (the most resistant).

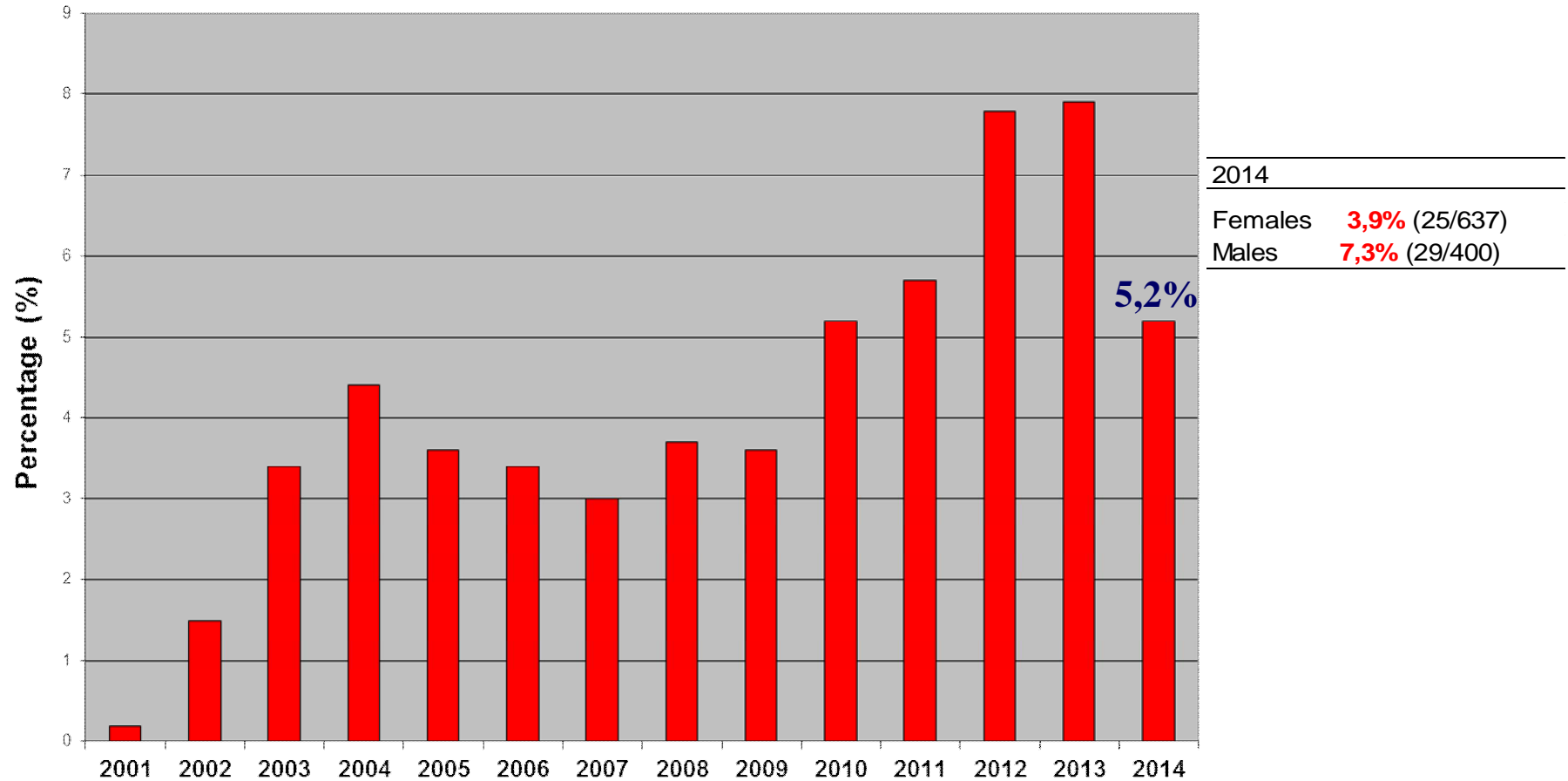
	n	Cfur	Ctax	Pi-Tz	Tob	Levo	Mero
E. coli	1510	11	8	7*	6	13	0
K. pneumoniae	337	8	3	4*	1	4	0
K. oxytoca	205	10	3	8	1	1	0
P. mirabilis	145	1	1	1*	4	6	0
E. cloacae	468	(36)**	21**	21***	1	3	0,5
Citrobacter spp.	222	(20)**	15**	15***	1	2	0
S. marcescens	245	98**	6**	6***	9	6	0
P. vulgaris	61	97**	2**	2***	0	0	0
M. morganii	89	94**	8**	8***	6	8	0

*: All ESBL isolates reported here as nonsusceptible.

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

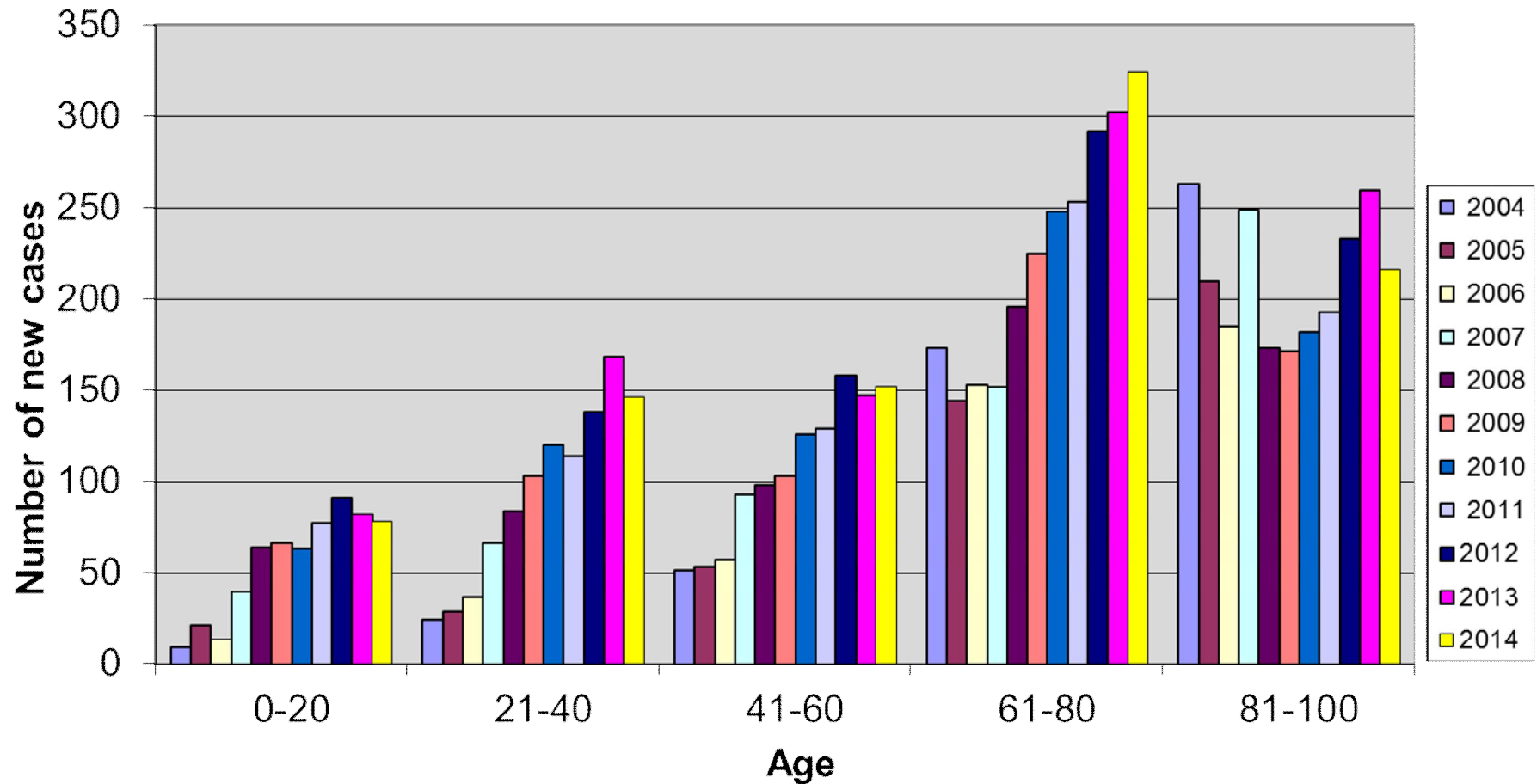
***: All cefotaxime-nonsusceptible isolates (mainly *ampC* strains) reported here as nonsusceptible

ESBL frequency in *E. coli* blood isolates. HUSLAB material 2001- 2014



One isolate per patient (the most resistant).

New cases of ESBL-*E. coli*
by age categories in HUSLAB material 2004 – 2014.
Screening excluded.



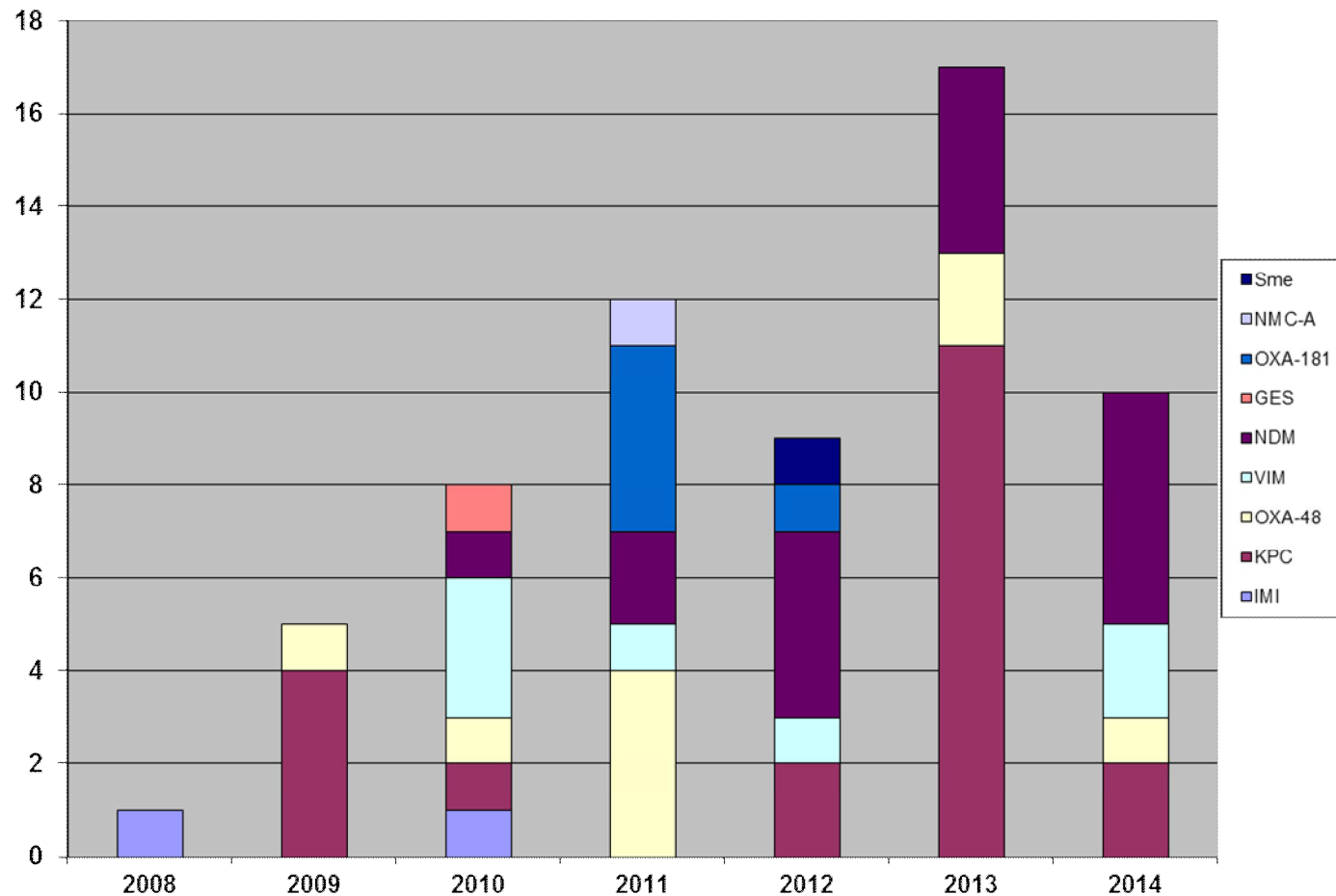
Resistance (%R+I) to non-betalactams and carbapenems in ESBL *E.coli* isolates 2014

HUSLAB material from Helsinki and Uusimaa districts. Blood, pus, and urine isolates.

One isolate per patient (the most resistant). Screenings excluded.

	E. coli
Ciprofloxacin/levofloxacin	68
Tobramycin	38
Sulphatrimetoprim	58
Trimetoprim	61
Nitrofurantoin	4
Fosfomycin	3
Meropenem	0
Ertapenem	2
<i>n</i>	1216

Carbapenemase-producing *Enterobacteriaceae* (CPE) in HUSLAB material 2008-2014



All KPC cases in 2013 were from one hospital epidemic.

2014: Totally 8 patients. One had both KPC and VIM, one NDM and VIM.

Enterobacteriaceae, urine isolates 2014 (%R)

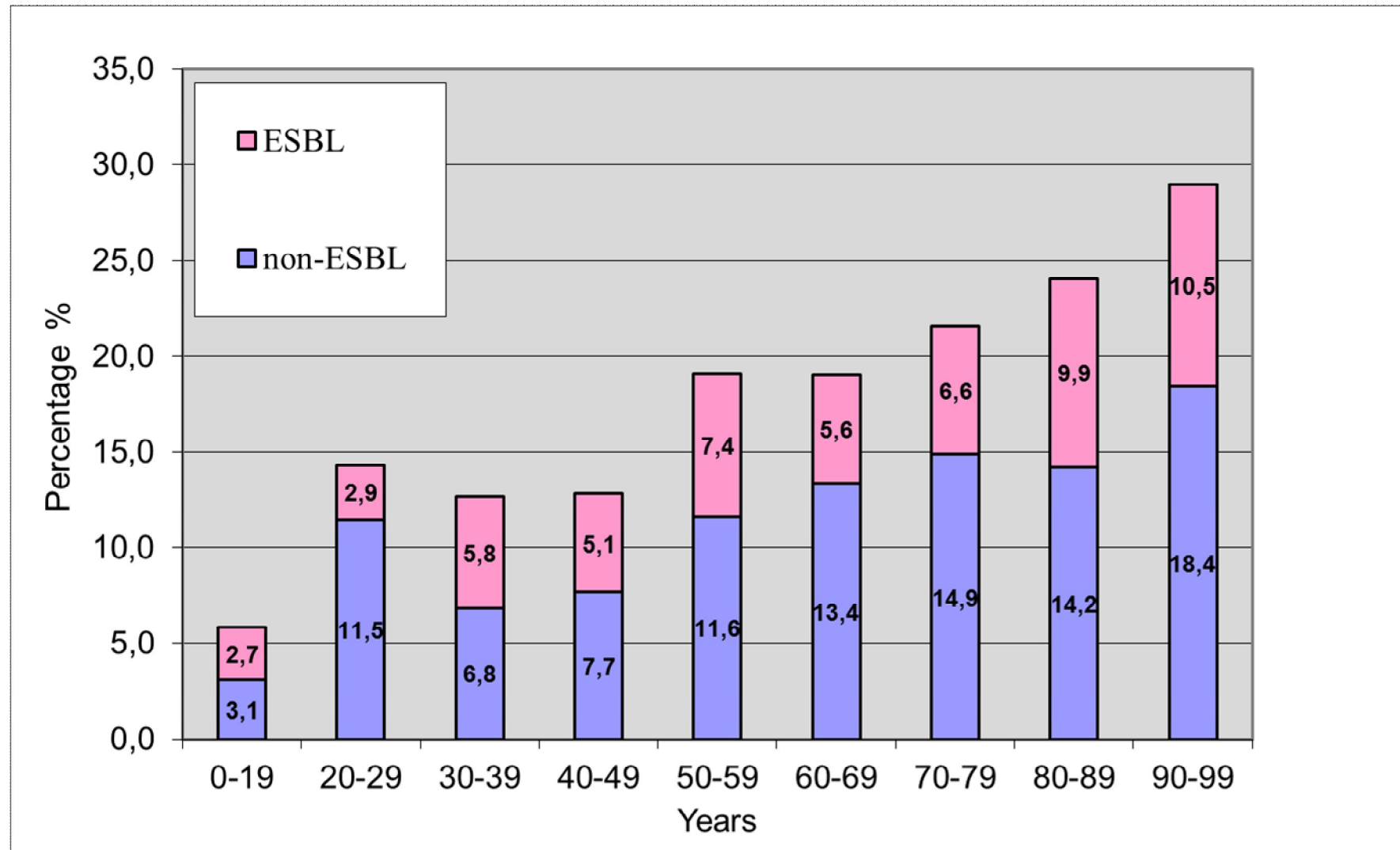
HUSLAB material from Helsinki and Uusimaa districts. One isolate per patient (the most resistant).

	E. coli	K. pneum.	P. mirabilis	Enterobacter spp.	Citrobacter spp.	Other*
Nitrofurantoin	1	17	100	28	4	91
Mecillinam**	4	6	6	[20]	[9]	[75]
Cephalexin	9	4	4	86	47	95
Cefuroxime	7	5	1	26	12	83
Ciprofloxacin	10	2	1	1	2	3
Trimetoprim	23	20	40	9	7	33
n	24564	2786	910	951	1074	555

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

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

Ciprofloxacin nonsusceptibility in urinary *E.coli* of male patients by age categories in 2013 (%R+I)

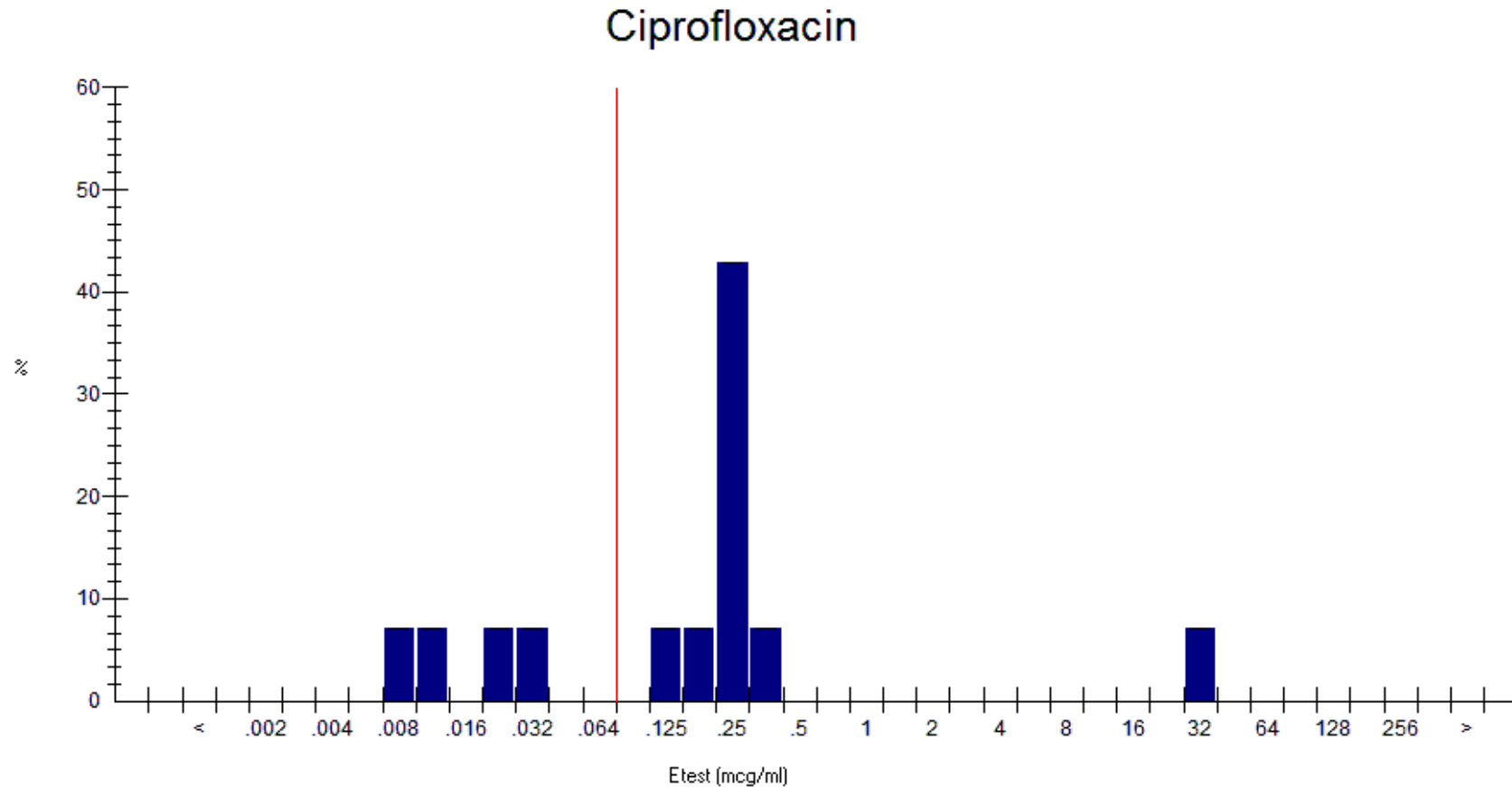


Pätäri-Sampo 2015

Salmonella typhi 2009 -2014, susceptibility to ciprofloxacin

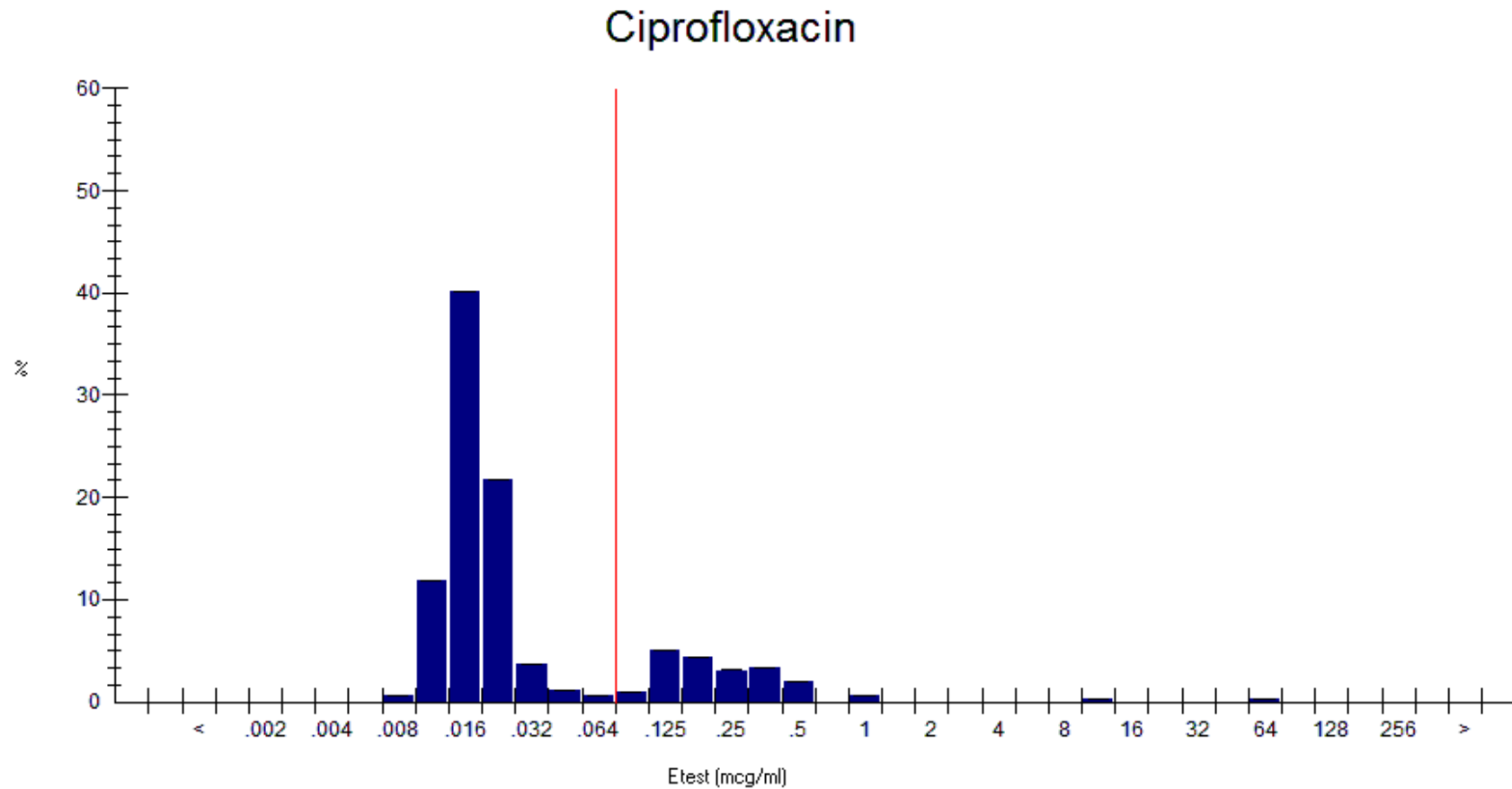
HUSLAB material from Helsinki and Uusimaa Districts.

One isolate per patient (the first isolate), $n = 15$



Salmonella spp 2014, susceptibility to ciprofloxacin

HUSLAB material from Helsinki and Uusimaa Districts.
One isolate per patient (the first isolate), $n = 322$



Salmonella ESBL, HUSLAB material 2011 – 2014

Year	Proportion (%) of ESBL strains	Number of studied isolates*
2011	2,6	389
2012	1,9	432
2013	1,8	391
2014	2,8	322

* One per patient

Shigella spp. 2014 (%R+I)

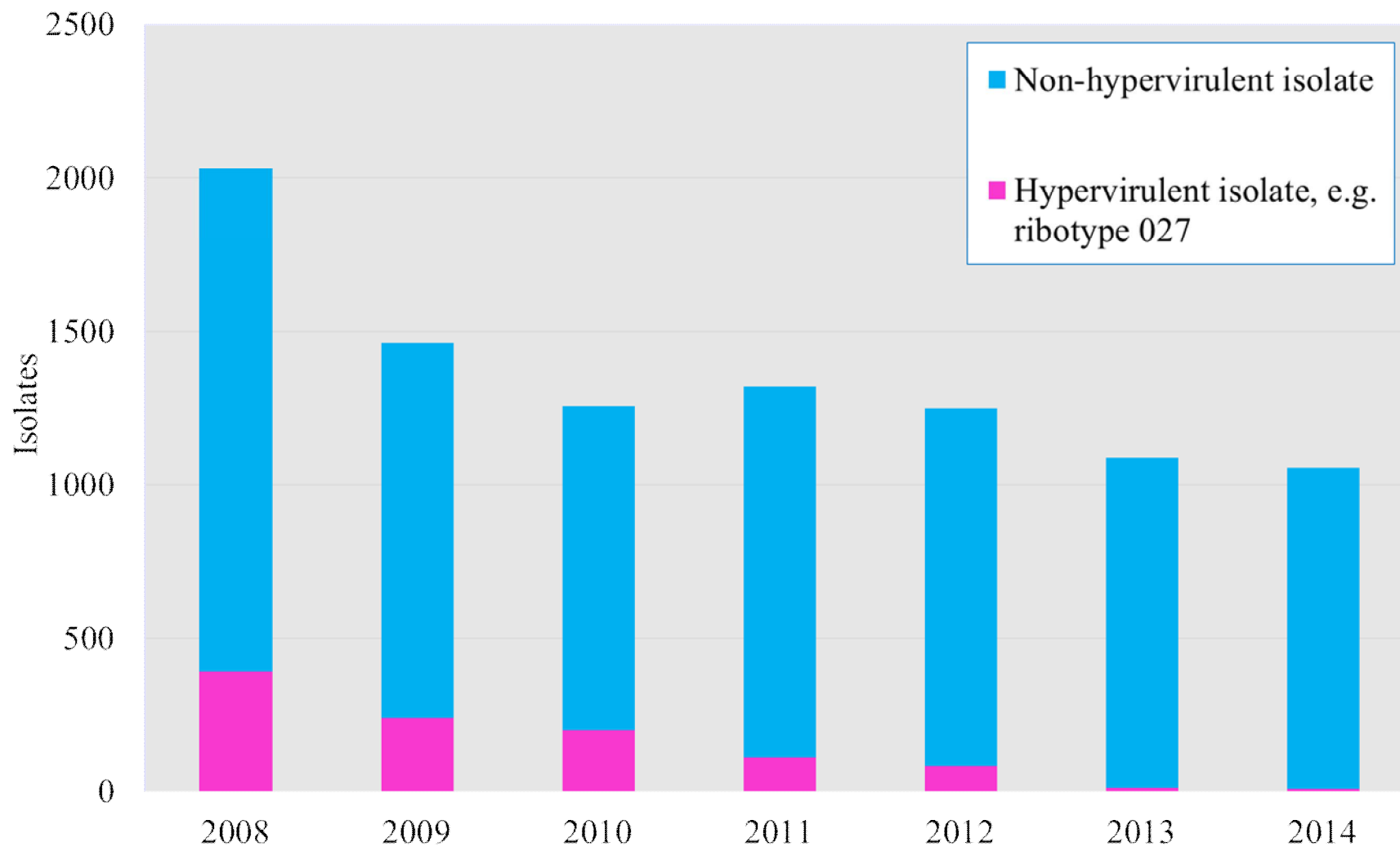
HUSLAB material from Helsinki and Uusimaa Districts.
One isolate per patient (the first isolate)

n = 39

Ampicillin	26
Ceftriaxone*	5
Ciprofloxacin	26
Sulphatrimetoprim	82
Doxycycline	82

* all ESBL: 2 isolates

Toxin producing *C.difficile* in HUSLAB material 2008-2014



One isolate per patient per year including screening samples

H. influenzae & *M. catarrhalis* 2014 (%R+I)

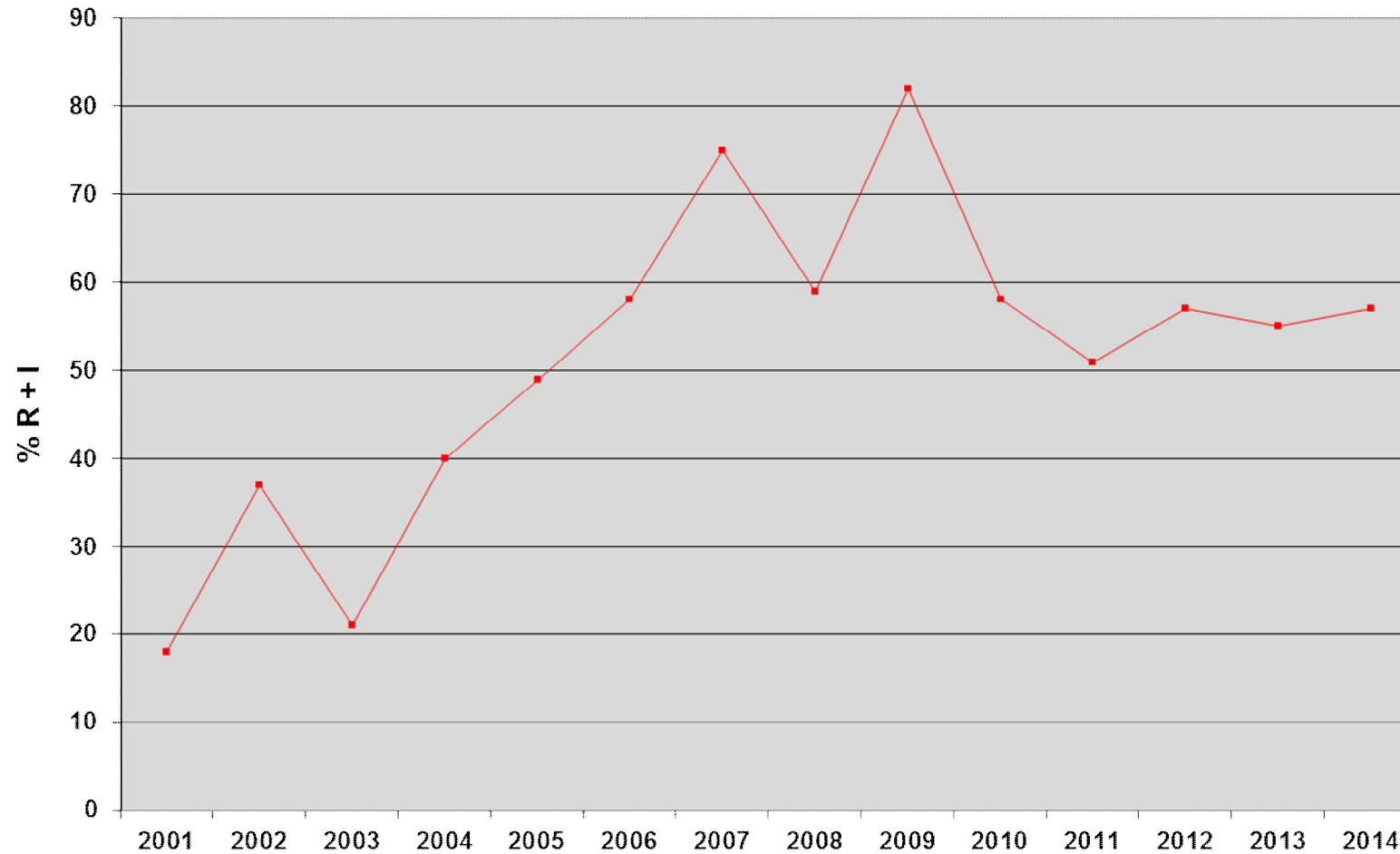
HUSLAB material from Helsinki and Uusimaa Districts.
One isolate per patient (the first isolate).

	H. influenzae	M. catarrh.
Ampicillin	21	100
Amoxicill-clavul.	3	1
Cefuroxime	4	0
Doxycycline	2	1
Ciprofloxacin	0	0
Sulphameth-trim.	38	3
Azithromycin	98*	4
n	757	291

* EUCAST breakpoint sets most isolates to category I (95%) and R (3%).

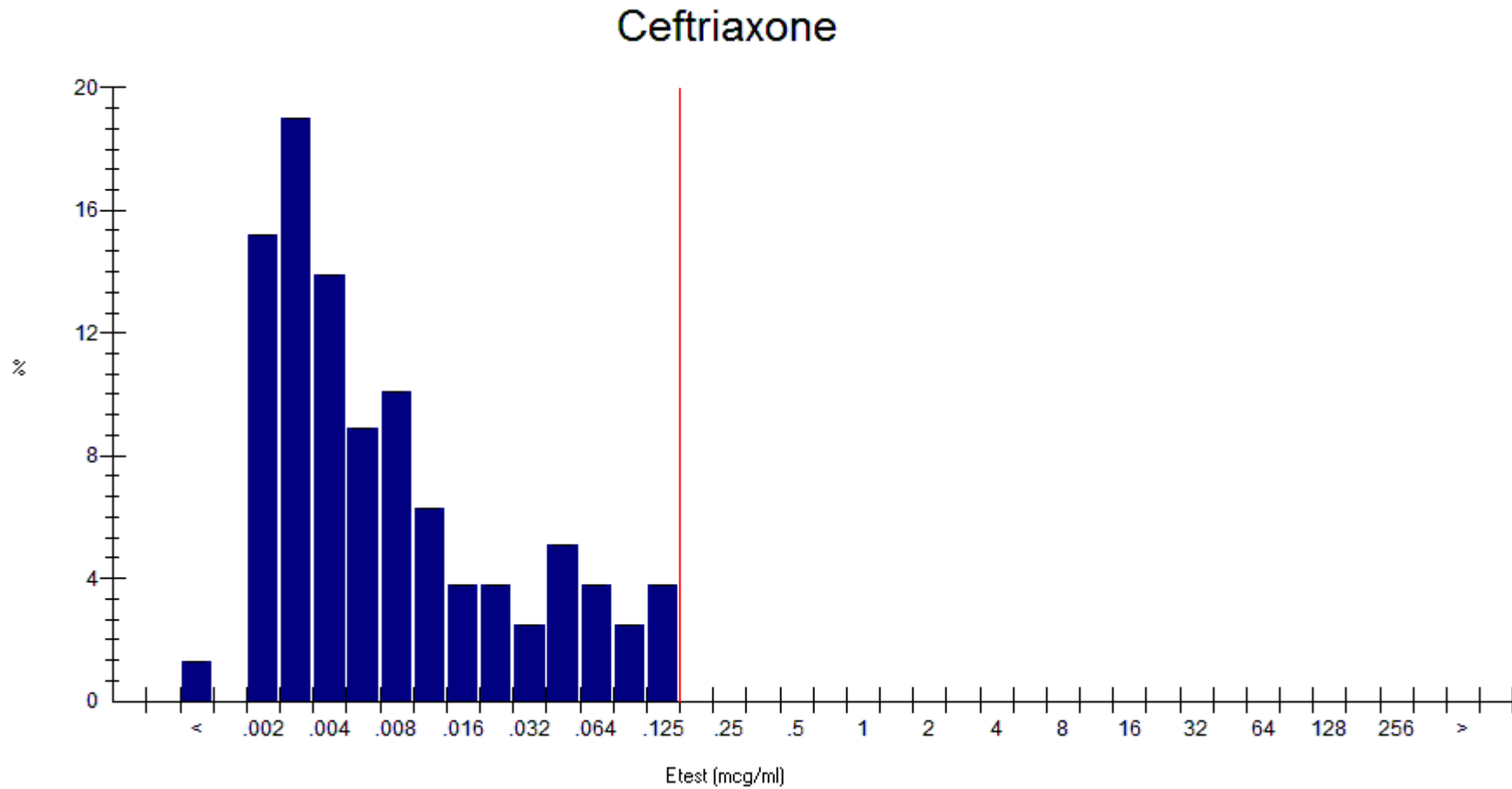
Neisseria gonorrhoeae, resistance to ciprofloxacin 2001-2014

HUSLAB material from Helsinki and Uusimaa Districts (2014, $n = 79$)



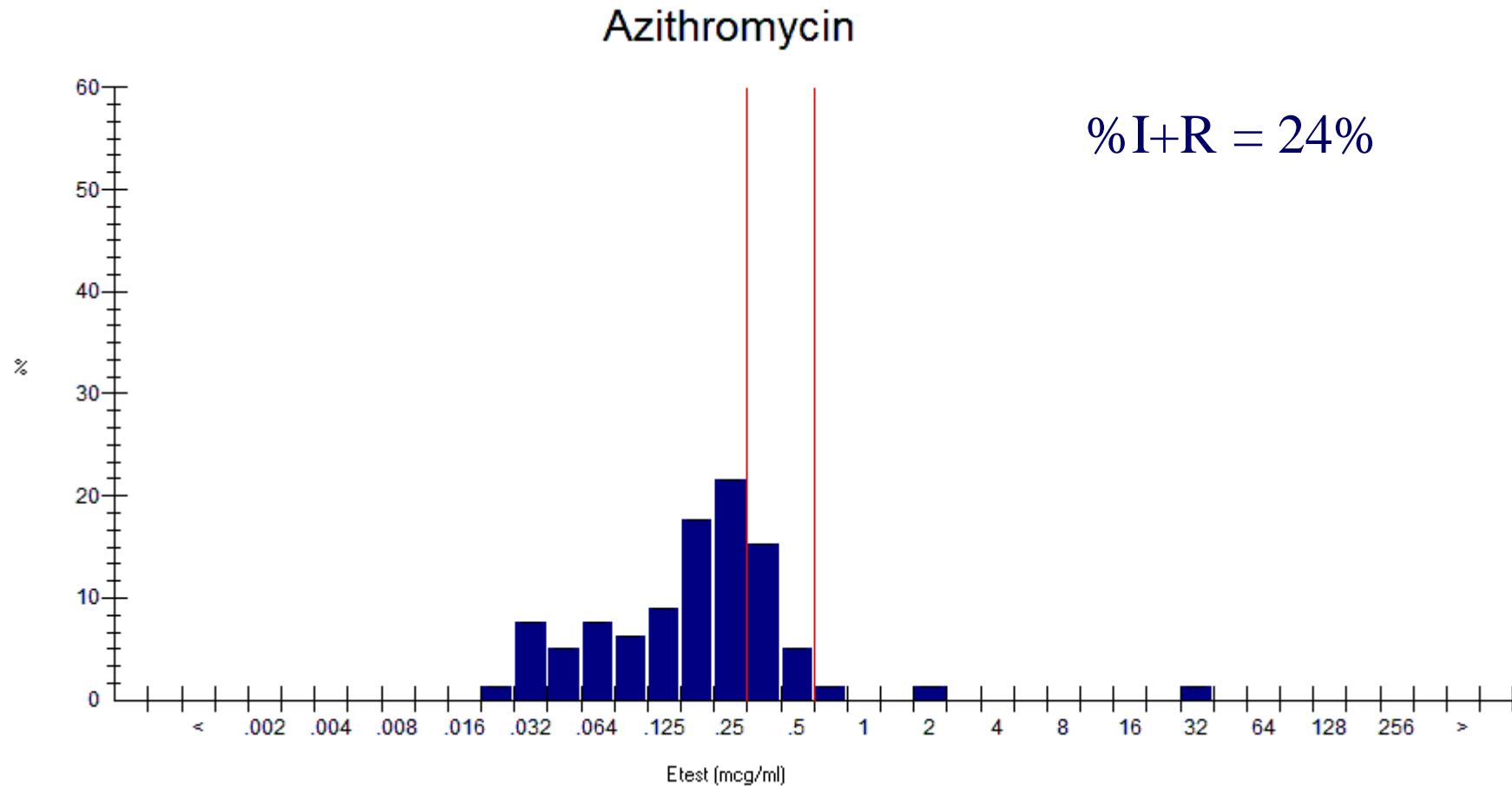
Neisseria gonorrhoeae, MIC of ceftriaxone 2014

HUSLAB material from Helsinki and Uusimaa Districts ($n = 79$)



Neisseria gonorrhoeae, MIC of azithromycin 2014

HUSLAB material from Helsinki and Uusimaa Districts ($n = 79$)



Neisseria meningitidis 2010 - 2014 (%R+I)

HUSLAB material from Helsinki and Uusimaa Districts.

Invasive isolates: blood and cerebrospinal fluid.

One isolate per patient (the first isolate)

Penicillin-I	17
Penicillin-R	3
Ceftriaxone	0
Meropenem	0
Ciprofloxacin	0
Chloramphenicol	0
n	35

Bacteroides spp. 2014 (%R+I)

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

n = 1120

Metronidazole	0
Piperacillin-tazobactam	4
Imipenem*	1
Clindamycin	45
Doxycycline	34
Penicillin G	100
Amoxicillin-clavulanate	5

*tested n=230

Susceptibilities determined mainly by disc diffusion method using in-house zone diameter breakpoints.