

**HUSRES Annual Report 2010**  
**Martti Vaara**



**[www.huslab.fi](http://www.huslab.fi)**

**[www.intra.hus.fi](http://www.intra.hus.fi)**

*The basis of this HUSRES 2010 report is the HUSLAB/Whonet database 2010, which contains susceptibility data on more than 196.000 bacteria isolated and studied in 2010 by HUSLAB. The susceptibility interpretations are according to CLSI 2009.*

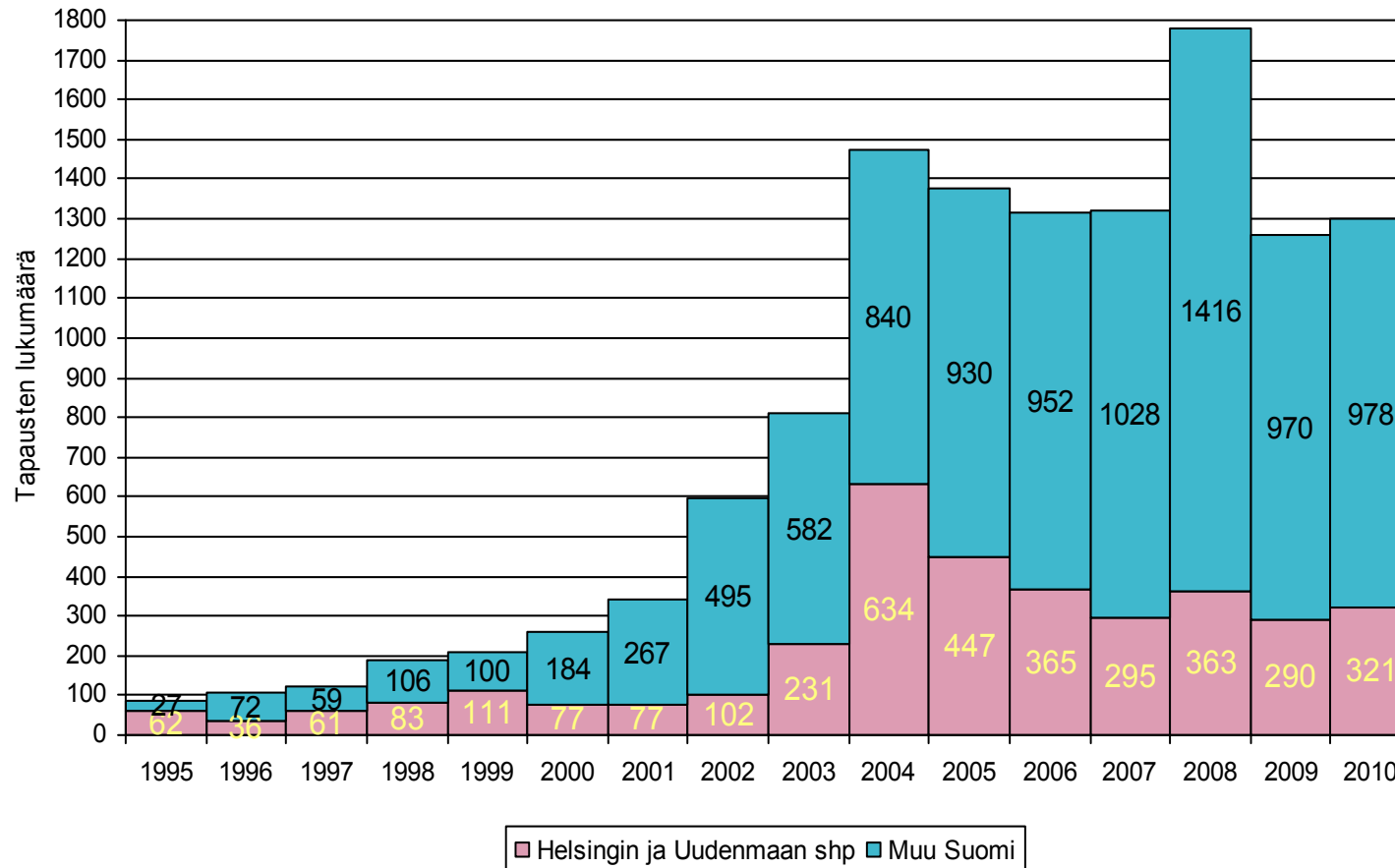
*The isolates originate from patients in Helsinki University Hospital, other hospitals in Helsinki - Uusimaa region as well as outpatient health centers.*

*HUSRES 2010 report contains data on 31 clinically most important bacterial species/groups.*

*Previous annual reports from 2000 are also located at [www.huslab.fi](http://www.huslab.fi)*

# MRSA cases in Finland 1995 – 2010

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



Source: National Institute for Health and Welfare

Martti Vaara, 2/2011

## *Staph. aureus* 2010 (%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	Dox	Net	Lnz	SxT
HUCH (7 hosp)	1781	3	7	6	4	0	5	2	0	0	0
Blood isolates	332	2	5	4	4	0	4	1	0	0	0
Jorvi Hospital	586	2	5	3	4	0	5	2	0	0	0
Peijas Hospital	302	1	5	4	1	1	6	1	0	0	0
Hyvinkää Hosp	311	2	5	5	2	0	5	0	0	0	2
Outpatients	2809	2	6	4	3						
All sources	7860	2	6	3	3	0	5	2	0	0	0

## Coagulase-negative *staphylococci* 2010 (%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
<b>St. epidermidis</b>	<b>1960</b>	<b>70</b>	<b>55</b>	<b>43</b>	<b>45</b>	<b>11</b>	<b>54</b>	<b>14</b>	<b>11</b>	<b>0</b>	<b>39</b>
<b>St. haemolyticus</b>	<b>58</b>	<b>100</b>	<b>91</b>	<b>66</b>	<b>97</b>	<b>18</b>	<b>49</b>	<b>23</b>	<b>2</b>	<b>0</b>	<b>60</b>
<b>St. lugdunensis</b>	<b>49</b>	<b>4</b>	<b>10</b>	<b>10</b>	<b>0</b>	<b>0</b>	<b>15</b>	<b>5</b>	<b>0</b>	<b>0</b>	<b>0</b>

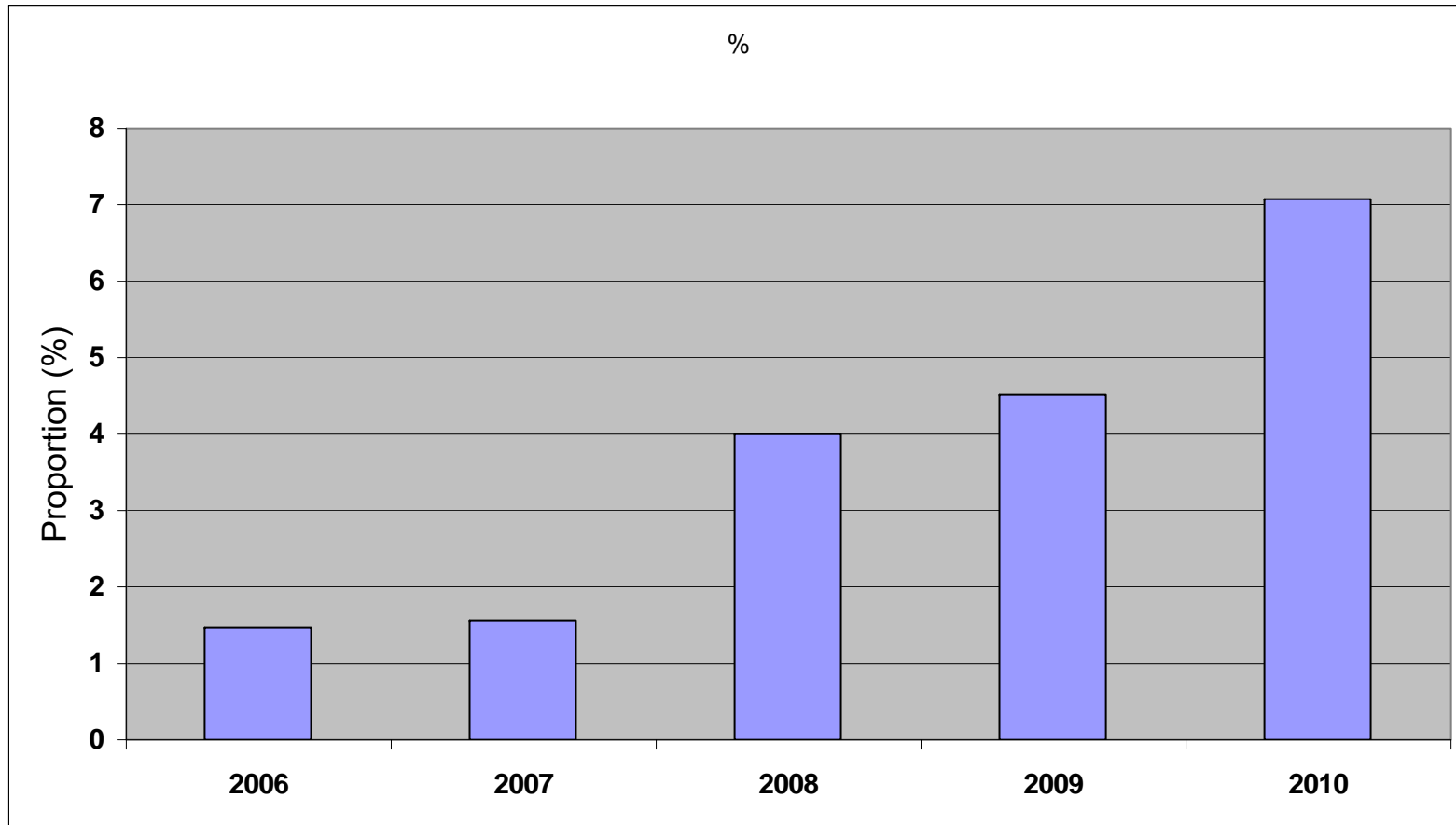
## *Streptococcus pneumoniae* 2010 (%R+I)

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

	All	Blood
Penicillin - R	2,6	1,2
Penicillin - I*	20,6	21,2
Ceftriaxone - R	0,1	0
Ceftriaxone - I	0,0	0
Erythromycin	29	30
Clindamycin	14	10
Doxycycline	16	
Sulphamet-Trim.	34	
Levofloxacin		0,0
Moxifloxacin		0,0
Telithromycin		0,5
<i>n</i>	749	240

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

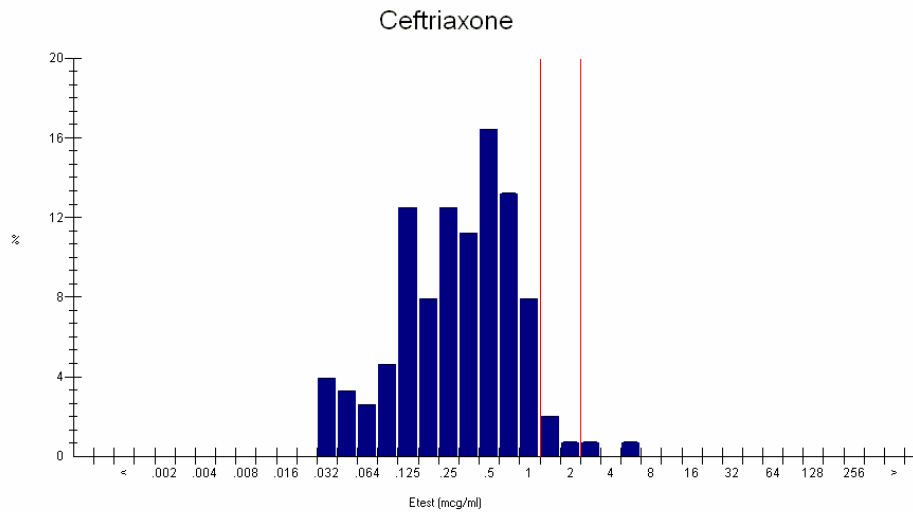
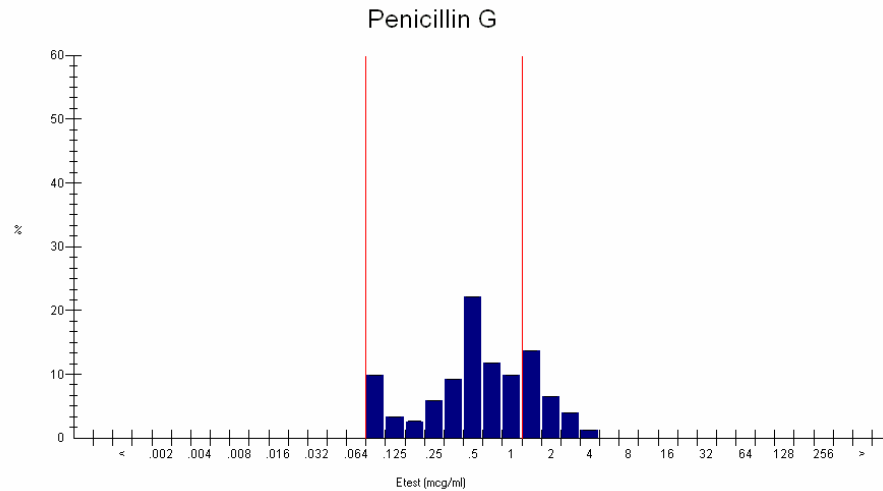
## Multiresistant pneumococci\* 2006 – 2010 (HUSLAB)



\* Pen MIC  $\geq 0.12$   $\mu\text{g/ml}$  and non-susceptibility to Ery, Cli, Dox and SxT.  
One isolate per patient.

# Multiresistant pneumococci\* 2008 – 2010 (HUSLAB)

MIC distribution for penicillin G and ceftriaxone ( $n = 135$ )



\* Pen MIC  $\geq 0.12 \mu\text{g/ml}$  and non-susceptibility to Ery, Cli, Dox and SxT.



## Beta-hemolytic streptococci 2010 (%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	12	12
Clindamycin	2	11	10
n	7804	4673	4409

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

## ***Streptococcus viridans* group, blood isolates 2010**

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

<b>Penicillin -I</b>	<b>10</b>
<b>Penicillin -R</b>	<b>3</b>
<b>Ceftriaxone -I</b>	<b>1</b>
<b>Ceftriaxone -R</b>	<b>1</b>
<b>Erythromycin I+R</b>	<b>20</b>
<b>Clindamycin</b>	<b>7</b>
<b>Gentamycin -high res.</b>	<b>0</b>
<b>Vancomycin</b>	<b>0</b>

n = 136

## ***Str. anginosus [milleri] group 2010 (%R+I)***

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

n = 666

<b>Penicillin</b>	<b>0</b>
<b>Cephalospor. I gen.</b>	<b>0</b>
<b>Erythromycin</b>	<b>7</b>
<b>Clindamycin</b>	<b>7</b>
<b>Vancomycin</b>	<b>0</b>

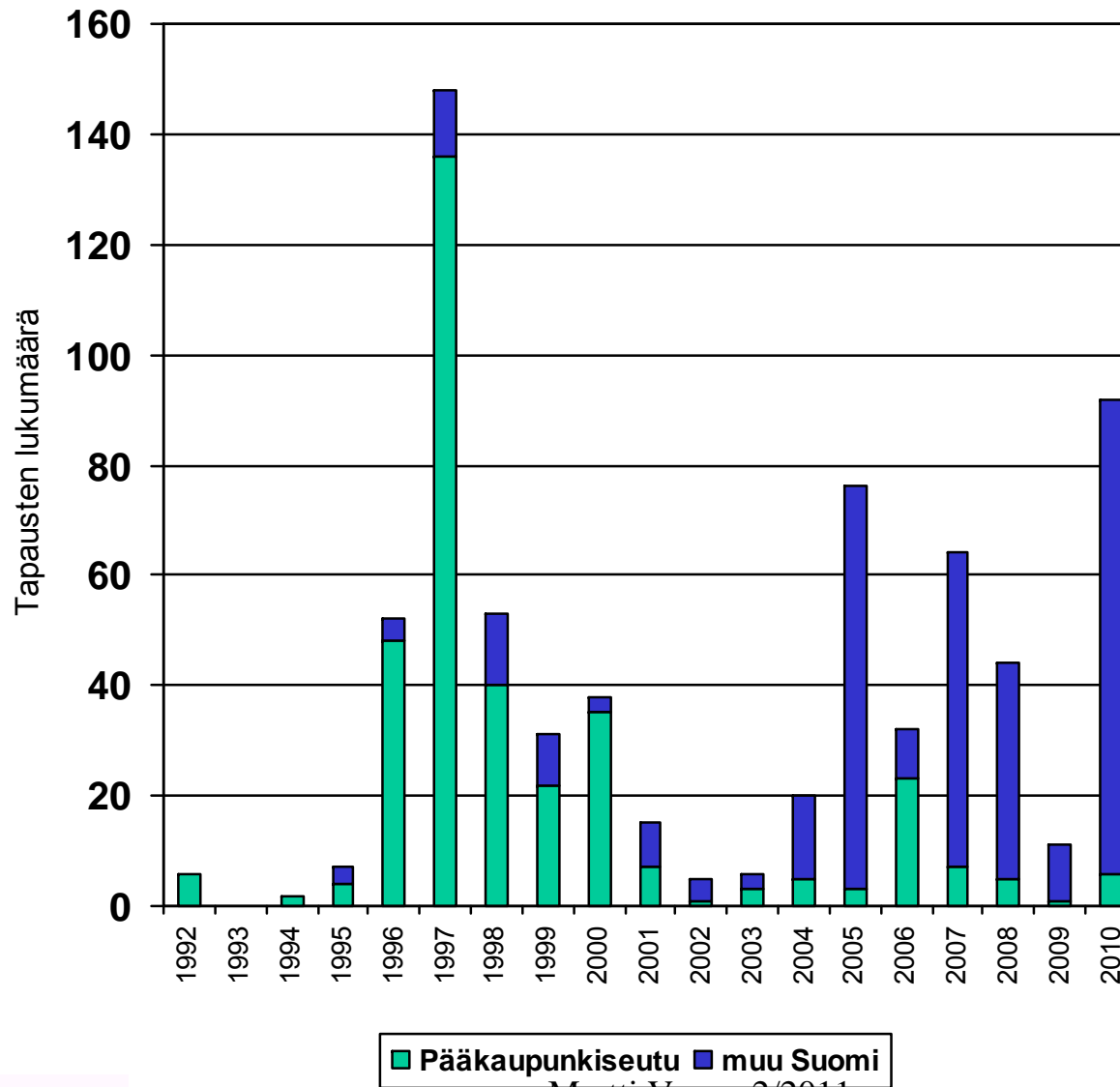
## *E. faecalis* and *E. faecium* 2010

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

	<i>E. faecalis</i>			<i>E. faecium</i>		
	pus	blood	urine	pus	blood	urine
<b>Ampicillin</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>95</b>	<b>84</b>	<b>98</b>
<b>Imipenem</b>	<b>0</b>	<b>0</b>		<b>95</b>	<b>94</b>	
<b>Linezolid-I</b>	<b>0</b>	<b>0</b>		<b>0</b>	<b>2</b>	
<b>Linezolid-R</b>	<b>0</b>	<b>0</b>		<b>0</b>	<b>0</b>	
<b>Vancomycin</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
<b>Gentam. (hi)</b>		<b>12</b>			<b>9</b>	
<b>Levofloxacin</b>		<b>24</b>			<b>83</b>	
<b>Norfloxacin</b>			<b>23</b>			<b>98</b>
<b>Nitrofurantoin</b>			<b>0</b>			<b>95</b>
<b>SuTri</b>			<b>20</b>			<b>95</b>
<b><i>n</i></b>	<b>1243</b>	<b>86</b>	<b>4384</b>	<b>367</b>	<b>50</b>	<b>999</b>

# VRE cases in Finland 1992-2010

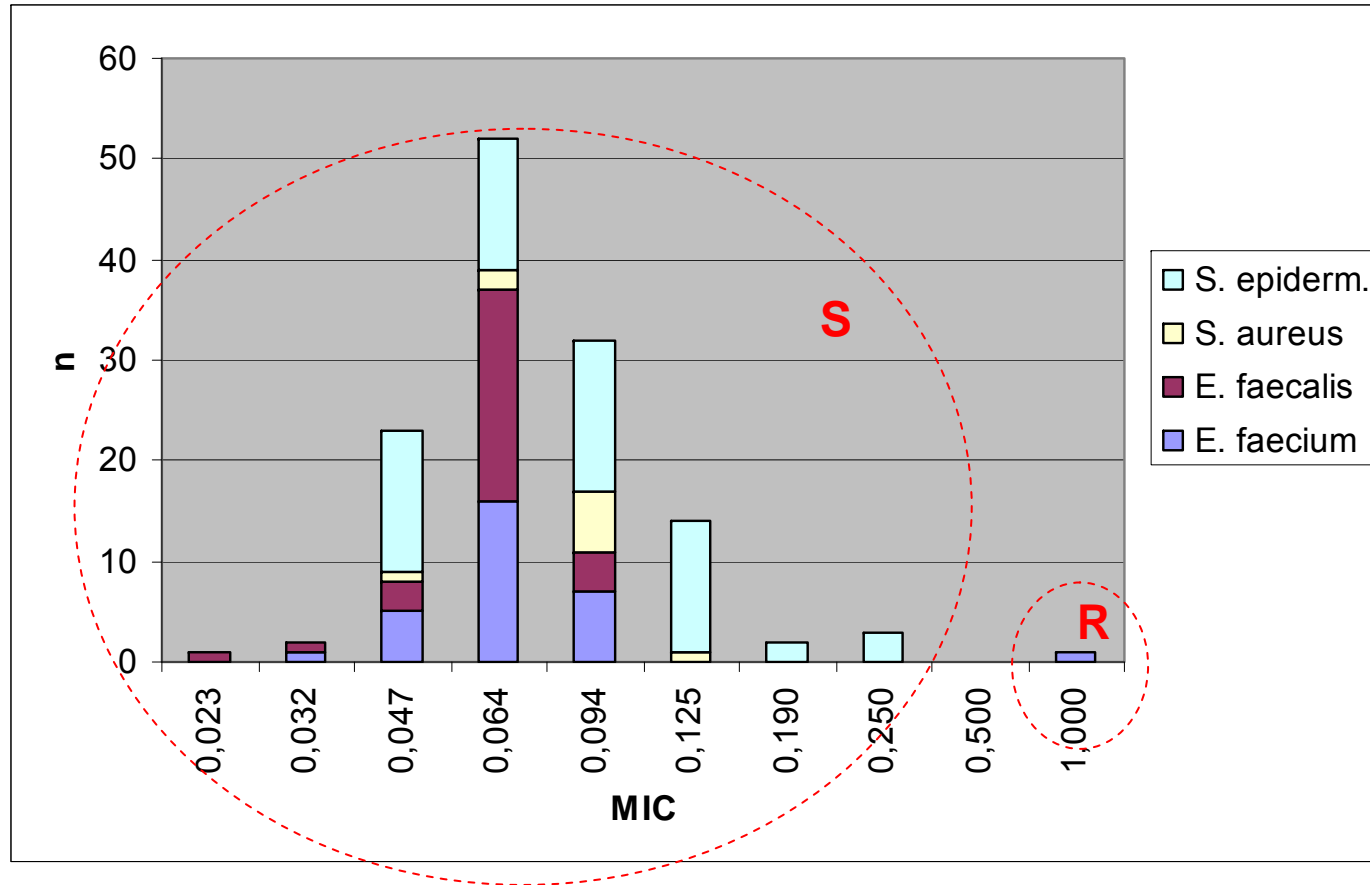
Green columns: Helsinki and Uusimaa District; blue columns: other parts of Finland



Martti Vaara, 2/2011

# Staphylococci and enterococci, susceptibility to tigecycline 2010

Breakpoints (EUCAST) for staphylococci  $S \leq 0,5$  :  $R > 0,5$  and for enterococci  $S \leq 0,25$  :  $R > 0,5$



Consecutive independent pus isolates, HUSLAB material: Number of strains: *E. faecium* 30; *E. faecalis* 30; *S. aureus* 10; *S. epidermidis* 60.

## *Pseudomonas aeruginosa* 2010 (%R+I)

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

	<b>n</b>	<b>Ctaz</b>	<b>Mero</b>	<b>Pi-Tz</b>	<b>Tob</b>	<b>Ami</b>	<b>Cip</b>
<b>Meilahti</b>	<b>228</b>	<b>5</b>	<b>10</b>	<b>8</b>	<b>5</b>	<b>3</b>	<b>18</b>
<b>Töölö</b>	<b>198</b>	<b>7</b>	<b>12</b>	<b>6</b>	<b>4</b>	<b>3</b>	<b>27</b>
<b>Helsinki City hospitals</b>	<b>164</b>	<b>7</b>	<b>10</b>	<b>8</b>	<b>4</b>	<b>3</b>	<b>19</b>
<b>Jorvi Hospital</b>	<b>170</b>	<b>8</b>	<b>9</b>	<b>9</b>	<b>3</b>	<b>1</b>	<b>18</b>
<b>Peijas Hospital</b>	<b>75</b>	<b>4</b>	<b>3</b>	<b>4</b>	<b>3</b>	<b>0</b>	<b>15</b>
<b>Childrens´ Hospital</b>	<b>46</b>	<b>0</b>	<b>4</b>	<b>0</b>	<b>2</b>	<b>2</b>	<b>0</b>
<b>Uusimaa regional hospitals</b>	<b>222</b>	<b>6</b>	<b>7</b>	<b>7</b>	<b>8</b>	<b>4</b>	<b>18</b>
<b>Outpat. in Health Cntrs</b>	<b>673</b>	<b>2</b>	<b>3</b>	<b>3</b>	<b>4</b>	<b>2</b>	<b>13</b>

## ***Acinetobacter spp.* and *S. maltophilia* 2010 (%R+I)**

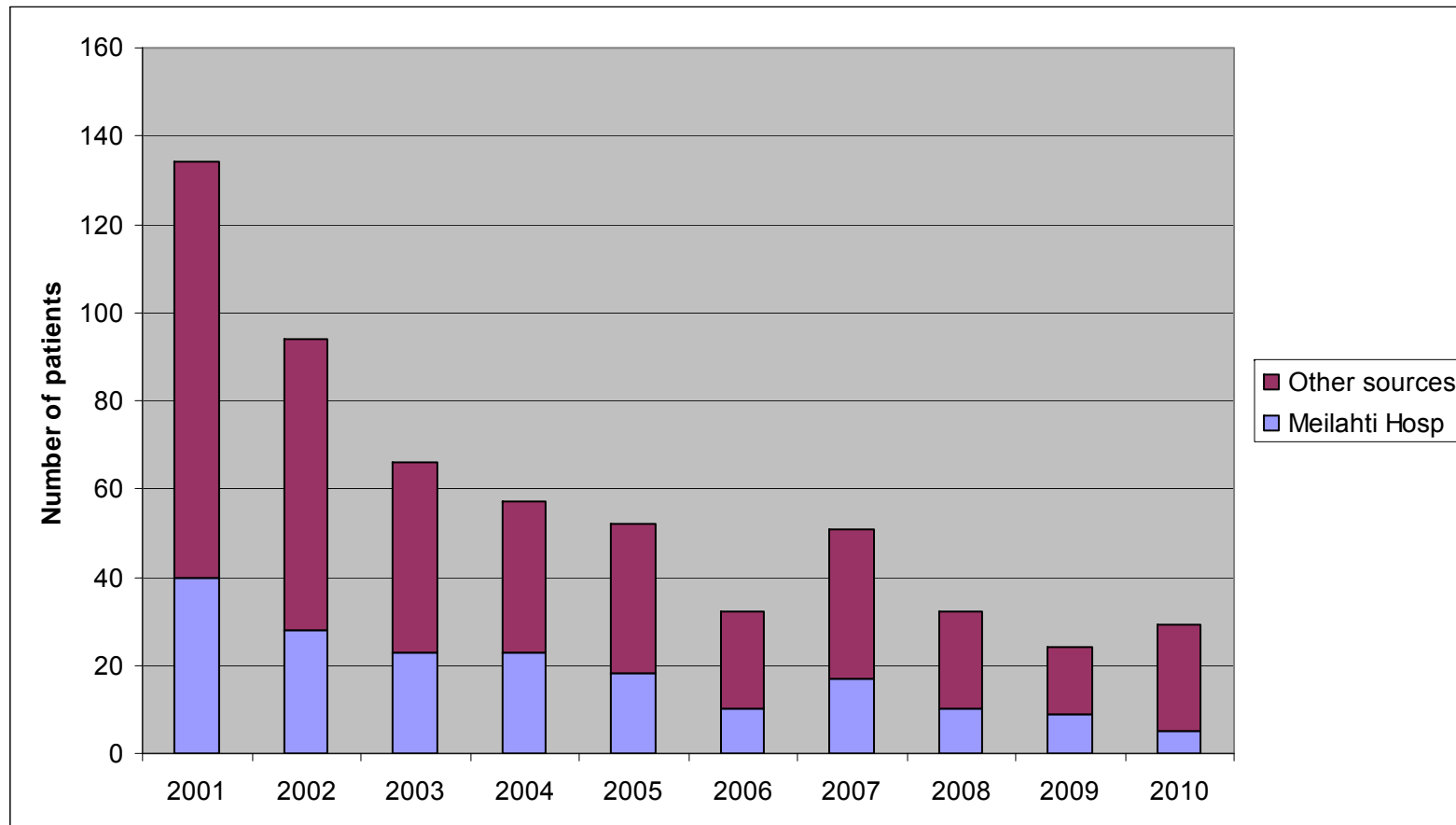
Pus and blood isolates from selected hospitals in Helsinki University Hospital. One isolate per patient (the most resistant)

	<b>n</b>	<b>Mero</b>	<b>Pi-Tz</b>	<b>Tob</b>	<b>Levo</b>	<b>SuTri</b>
<b>Acinetobacter</b>	<b>280</b>	<b>4</b>	<b>11</b>	<b>6</b>	<b>8</b>	<b>12</b>
<b>S. maltophilia</b>	<b>266</b>	<b>R</b>	<b>R</b>	<b>R</b>	<b>20</b>	<b>4</b>



## *Ps. aeruginosa*, MDR strains\*

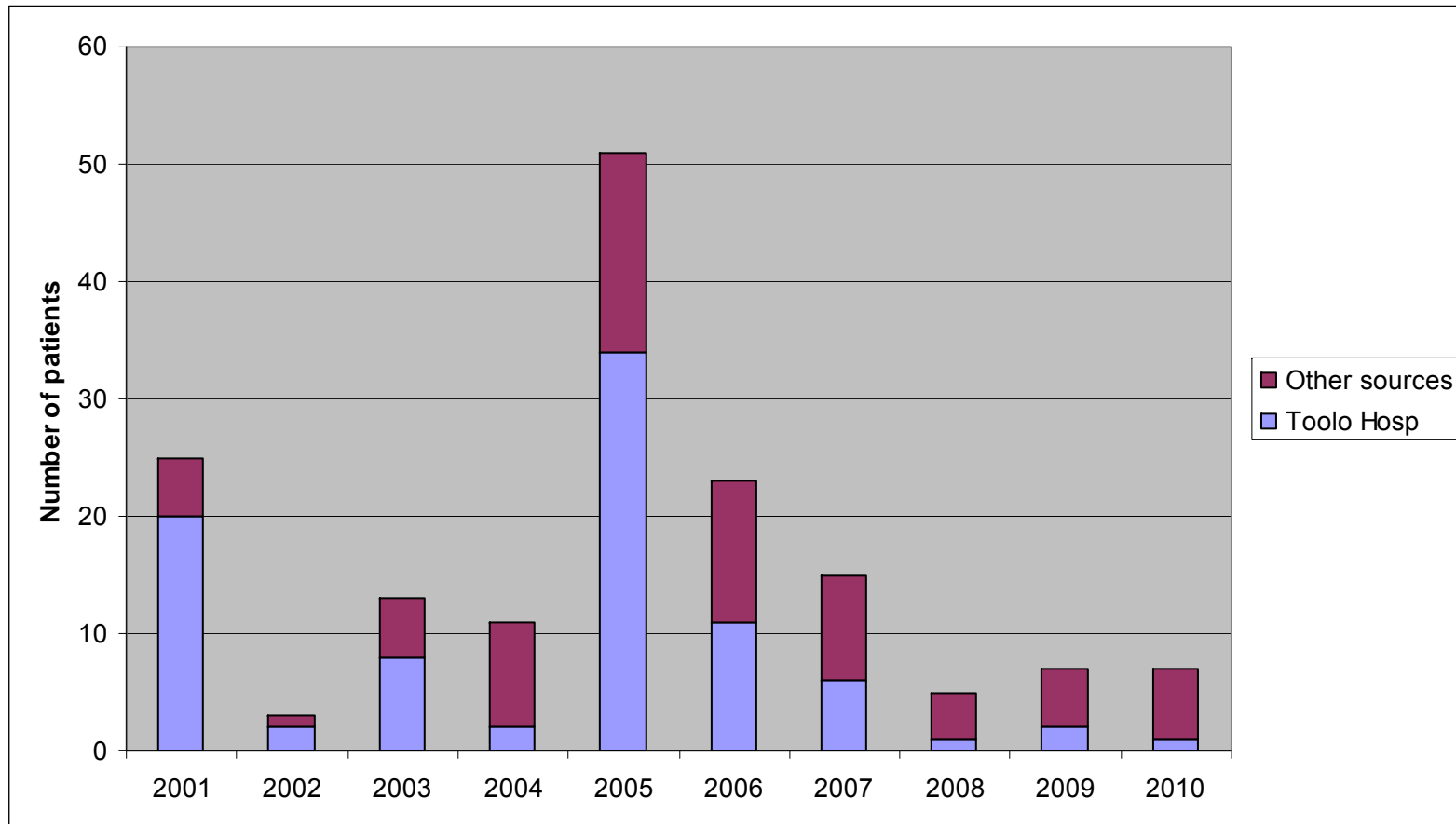
\*Nonsusceptibility to 1) meropenem and 2) tobramycin as well as 3) ceftazidime and/or piperacillin-tazobactam. HUSLAB material from Helsinki and Uusimaa District



## *Acinetobacter spp.*, MDR strains\*

\*Nonsusceptibility to meropenem, tobramycin and piperacillin-tazobactam

HUSLAB material from Helsinki and Uusimaa District



## *Enterobacteriaceae* 2010 (%R+I)

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

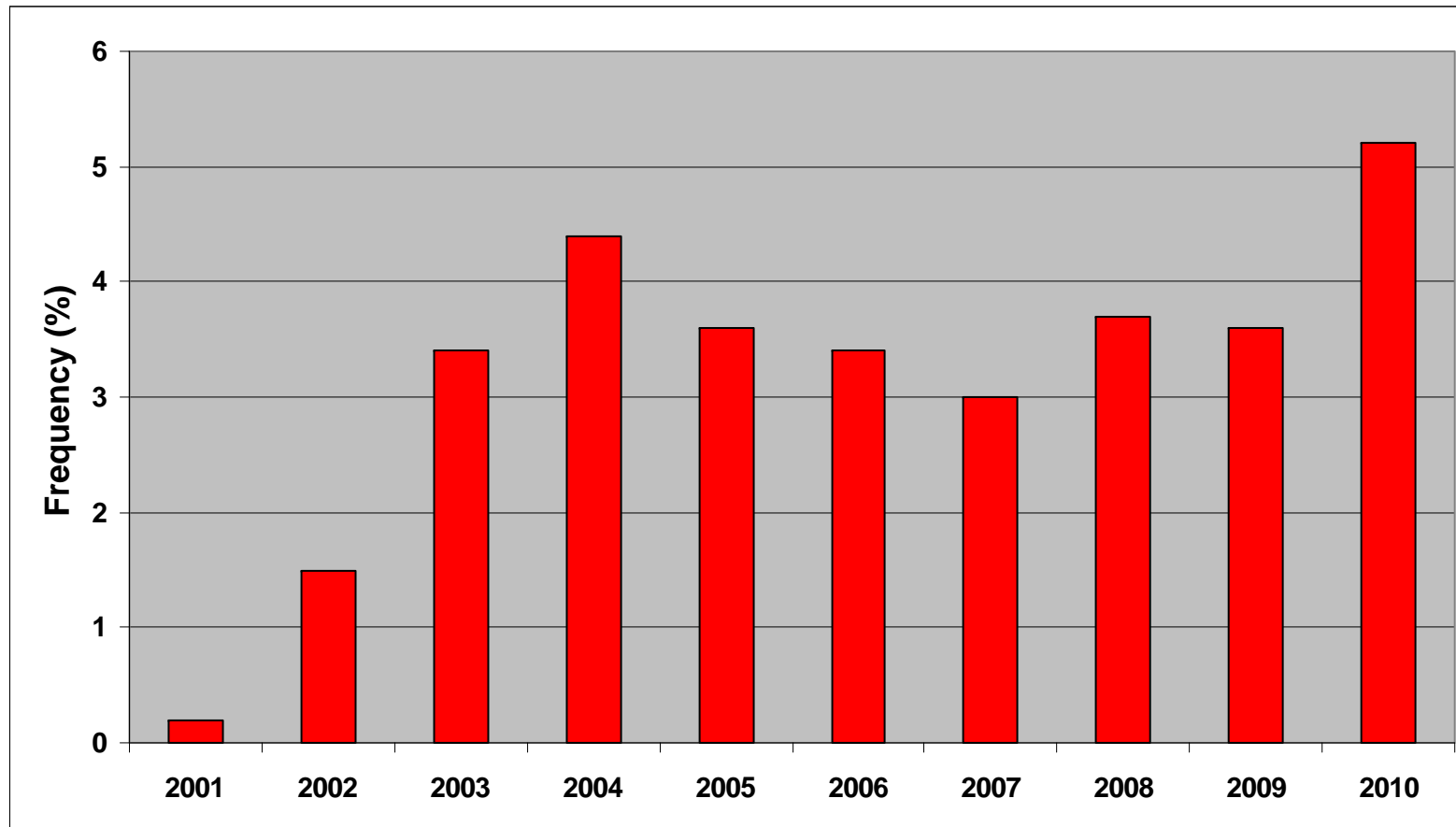
	n	Cfur	Ctax	Pi-Tz	Tob	Levo	Mero
<b>E. coli</b>	<b>1507</b>	<b>10</b>	<b>8</b>	<b>8*</b>	<b>7</b>	<b>11</b>	<b>0</b>
<b>Kl. pneumoniae</b>	<b>379</b>	<b>12</b>	<b>5</b>	<b>5*</b>	<b>3</b>	<b>3</b>	<b>1</b>
<b>Kl. oxytoca</b>	<b>236</b>	<b>7</b>	<b>1</b>	<b>7</b>	<b>1</b>	<b>0</b>	<b>0</b>
<b>Proteus mirabilis</b>	<b>167</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>1</b>	<b>0</b>
<b>Ent. cloacae</b>	<b>435</b>	<b>(36)</b>	<b>26**</b>	<b>26***</b>	<b>1</b>	<b>1</b>	<b>0</b>
<b>Citrob. spp.</b>	<b>131</b>	<b>(25)</b>	<b>21**</b>	<b>21***</b>	<b>1</b>	<b>3</b>	<b>0</b>
<b>Serratia marc.</b>	<b>216</b>	<b>94</b>	<b>7**</b>	<b>7***</b>	<b>3</b>	<b>5</b>	<b>0</b>
<b>Proteus vulgaris</b>	<b>75</b>	<b>91</b>	<b>3**</b>	<b>3***</b>	<b>0</b>	<b>0</b>	<b>0</b>
<b>Morganella morg</b>	<b>80</b>	<b>91</b>	<b>11**</b>	<b>11***</b>	<b>3</b>	<b>1</b>	<b>0</b>

\*: all ESBL strains reported here as nonsusceptible

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

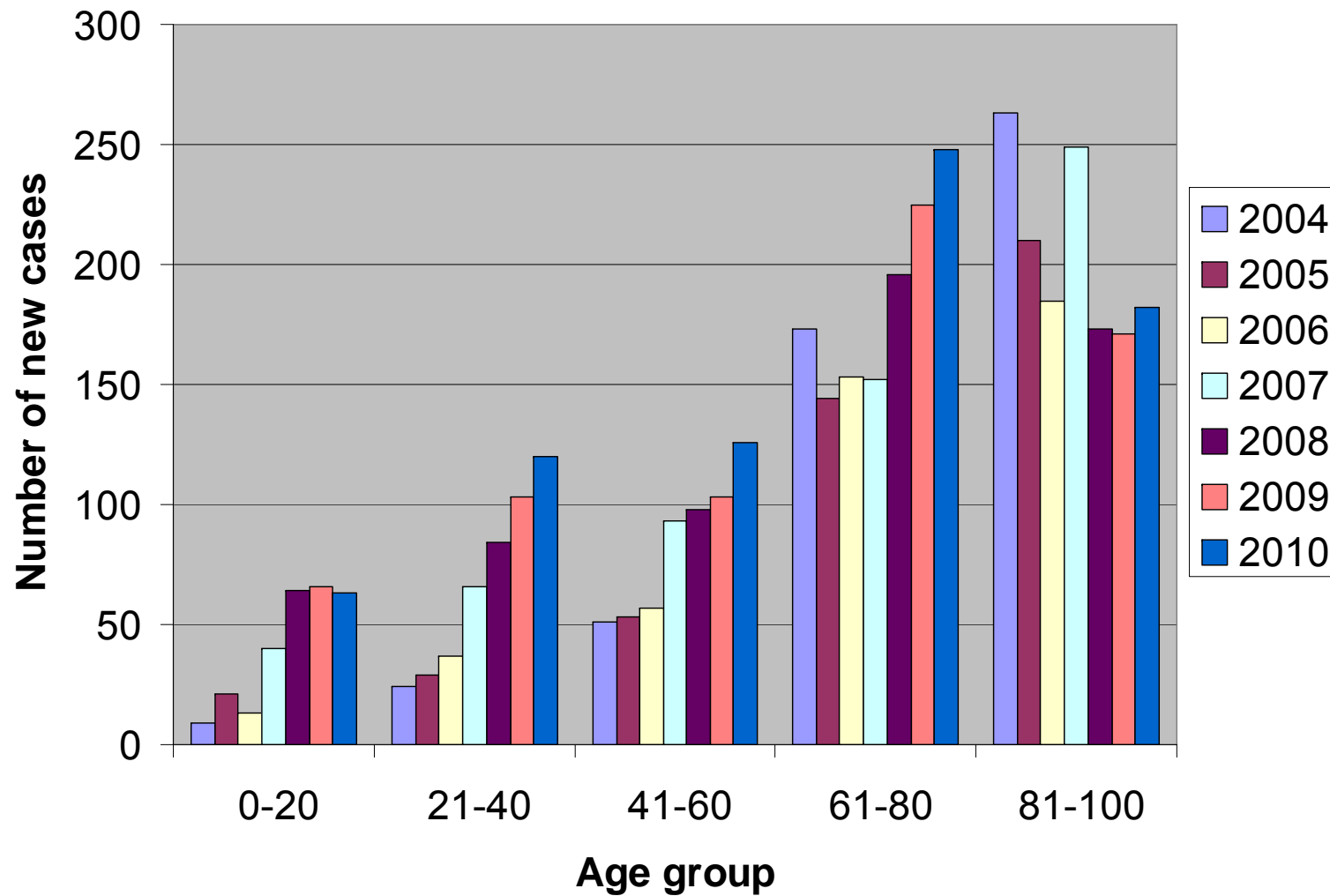
\*\*\*: all cefotaxime-nonsusceptible strains (mainly *ampC* strains) reported as nonsusceptible

## Frequency of *E. coli* ESBL among all *E. coli* blood isolates. HUSLAB material 2001- 2010



One isolate per patient.

*E. coli* ESBL 2004 – 2010,  
number of new cases by age categories in Huslab material

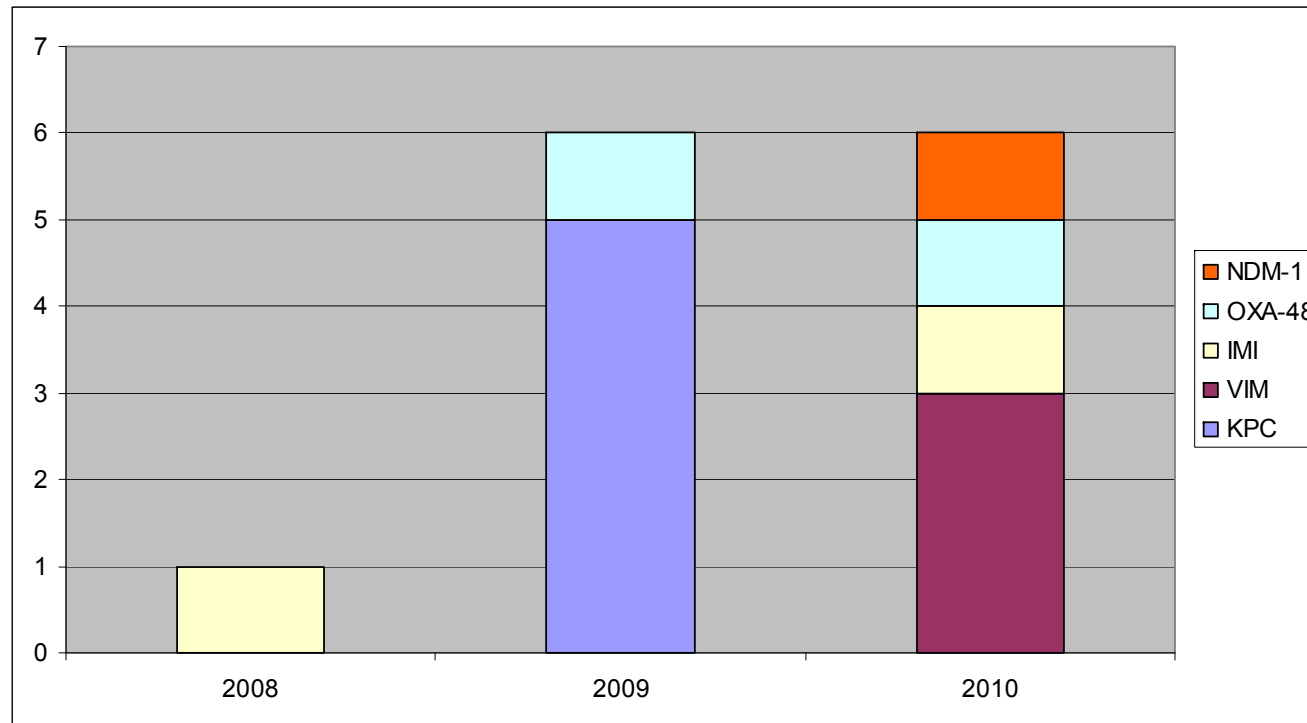


# ESBL strains, resistance to non-betalactams and carbapenems 2010

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

	<b>E. coli</b>
<b>Ciprofloxacin</b>	<b>71</b>
<b>Levofloxacin</b>	<b>73</b>
<b>Tobramycin</b>	<b>48</b>
<b>Sulphatrimetoprim</b>	<b>56</b>
<b>Trimetoprim</b>	<b>56</b>
<b>Nitrofurantoin</b>	<b>7</b>
<b>Meropenem</b>	<b>0</b>
<b>Ertapenem</b>	<b>1</b>
<b><i>n</i></b>	<b>1467</b>

# Carbapenemase-producing *Enterobacteriaceae* strains isolated at HUSLAB 2008 – 2010



In 2010, three of the strains were from samples sent to HUSLAB from hospitals outside the Helsinki-Uusimaa district. The strain producing IMI was *E. cloacae*, the other five strains were *K. pneumoniae*.

Jussi Kirveskari and Martti Vaara March 3, 2011

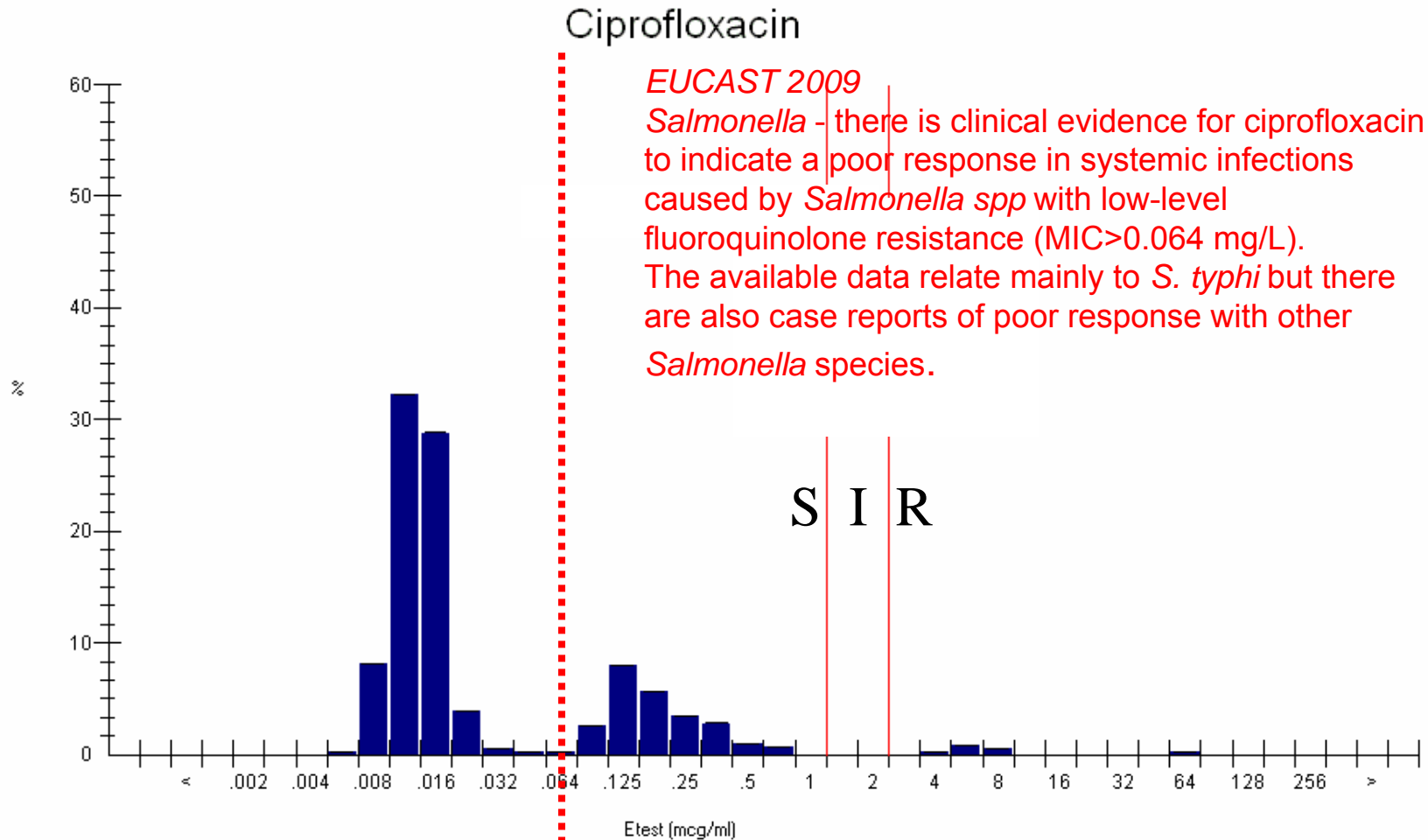
## *Enterobacteriaceae, urine isolates 2010 (%R)*

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

	<b>E. coli</b>	<b>Kl. pneum.</b>	<b>P. mirabilis</b>	<b>Other</b>
<b>Nitrofurantoin</b>	<b>2</b>	<b>17</b>	<b>100</b>	<b>36</b>
<b>Mecillinam</b>	<b>6</b>	<b>6</b>	<b>6</b>	<b>30</b>
<b>Cephalexin</b>	<b>13</b>	<b>7</b>	<b>2</b>	<b>53</b>
<b>Cefuroxime</b>	<b>4</b>	<b>2</b>	<b>0</b>	<b>32</b>
<b>Norfloxacin</b>	<b>9</b>	<b>2</b>	<b>2</b>	<b>3</b>
<b>Trimetoprim</b>	<b>22</b>	<b>21</b>	<b>44</b>	<b>18</b>
<b>n</b>	<b>23965</b>	<b>2776</b>	<b>917</b>	<b>2084</b>



# Salmonella 2008 -2010, susceptibility to ciprofloxacin



HUSLAB material ( $n = 615$ )

# *Salmonella typhi* 2005 -2010, susceptibility to ciprofloxacin

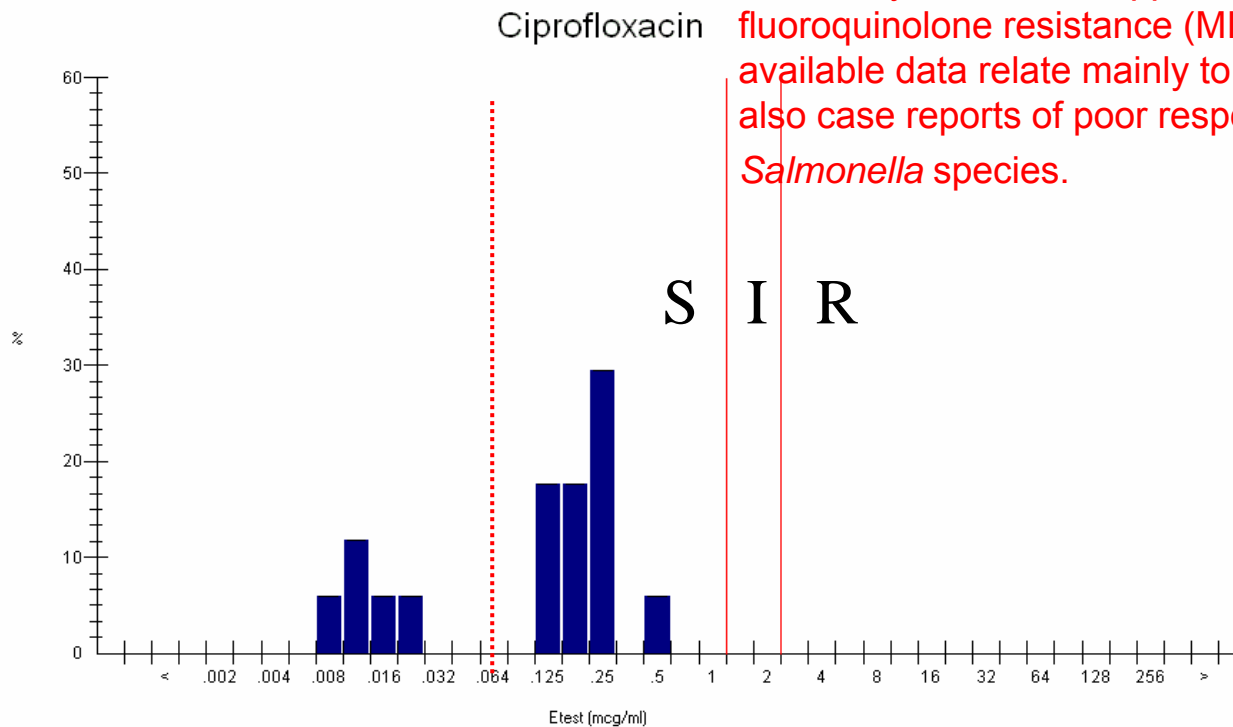
HUSLAB material from Helsinki and Uusimaa Districts.

One isolate per patient (the first isolate)

$n = 17$ , breakpoints according to CLSI

## *EUCAST 2011*

*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.



## *H. influenzae* & *M. catarrhalis* 2010 (%R+I)

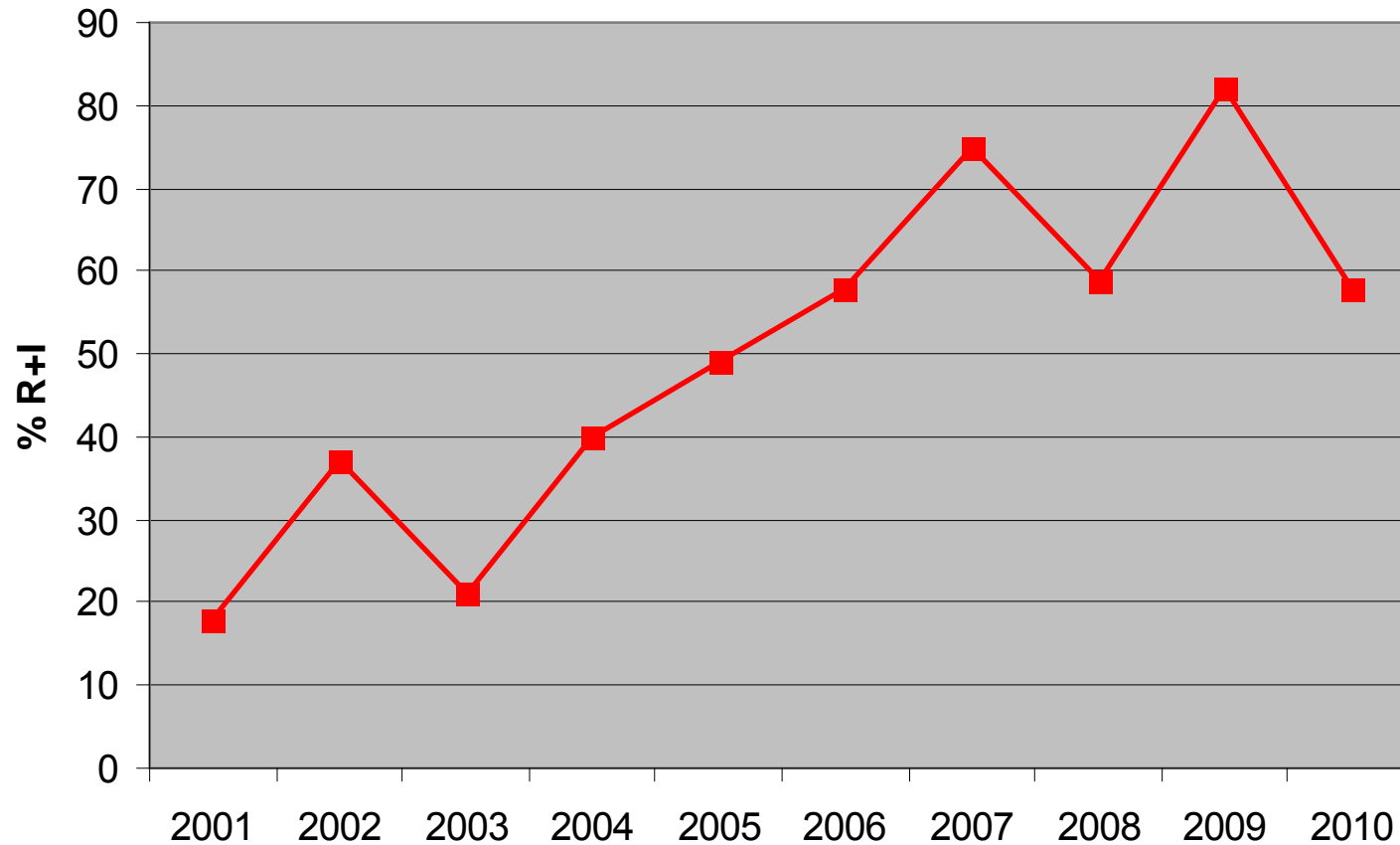
HUSLAB material from Helsinki and Uusimaa Districts.  
One isolate per patient (the first isolate)

	<b>H. influenzae</b>	<b>M. catarrh.</b>
<b>Ampicillin</b>	<b>20</b>	<b>100</b>
<b>Amoxycill-clavul.</b>	<b>2</b>	<b>0</b>
<b>Cefuroxime</b>	<b>2</b>	<b>0</b>
<b>Doxycycline</b>	<b>1</b>	<b>0</b>
<b>Ciprofloxacin</b>	<b>0</b>	<b>0</b>
<b>Sulphameth-trim.</b>	<b>22</b>	<b>0</b>
<b>Azithromycin</b>	<b>see*</b>	<b>0</b>
<b>n</b>	<b>677</b>	<b>298</b>

\* According to EUCAST 2011 breakpoints, the susceptibility of most isolates should be interpreted as I.

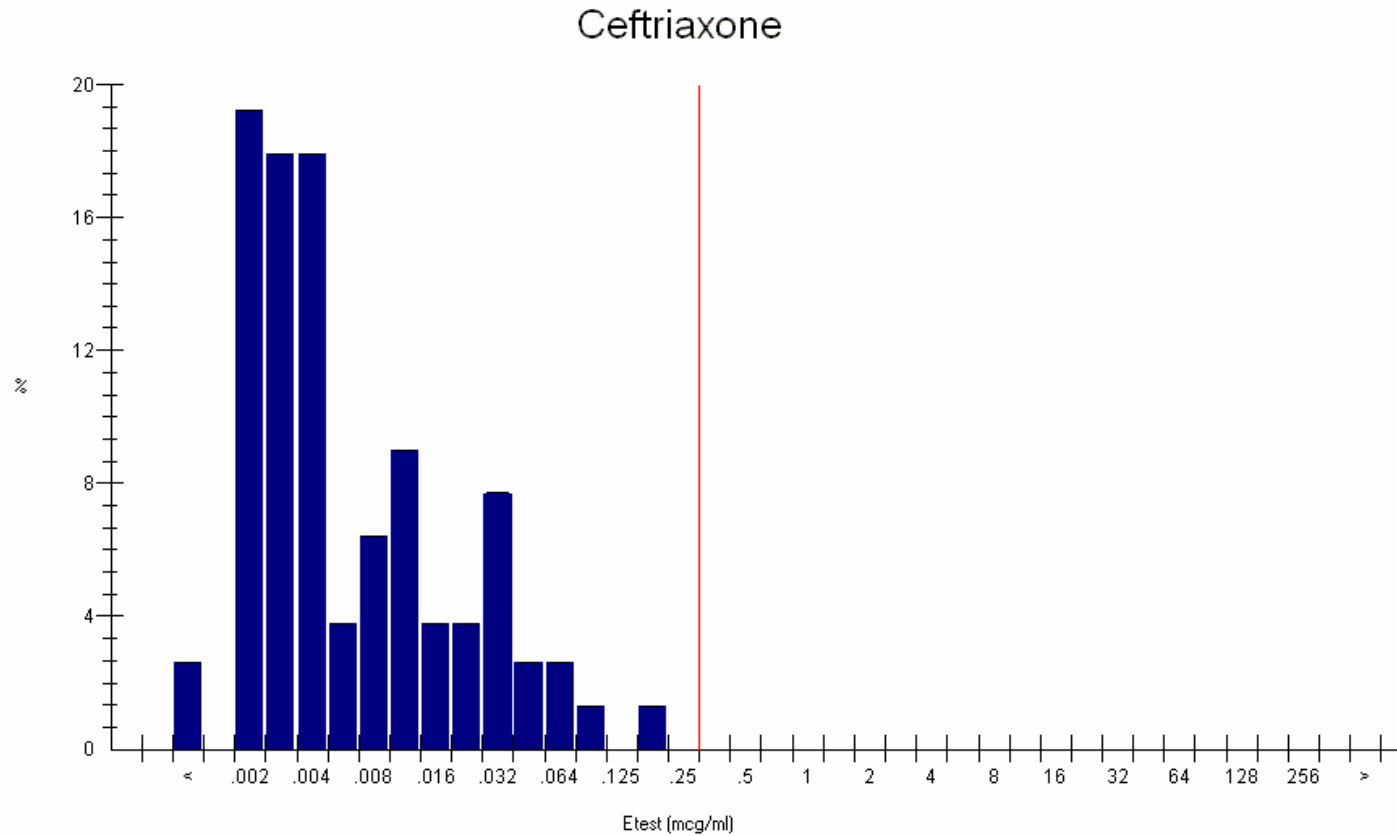
# *Neisseria gonorrhoeae*, resistance to ciprofloxacin 2001-2010

HUSLAB material from Helsinki and Uusimaa Districts (2010,  $n = 78$ )



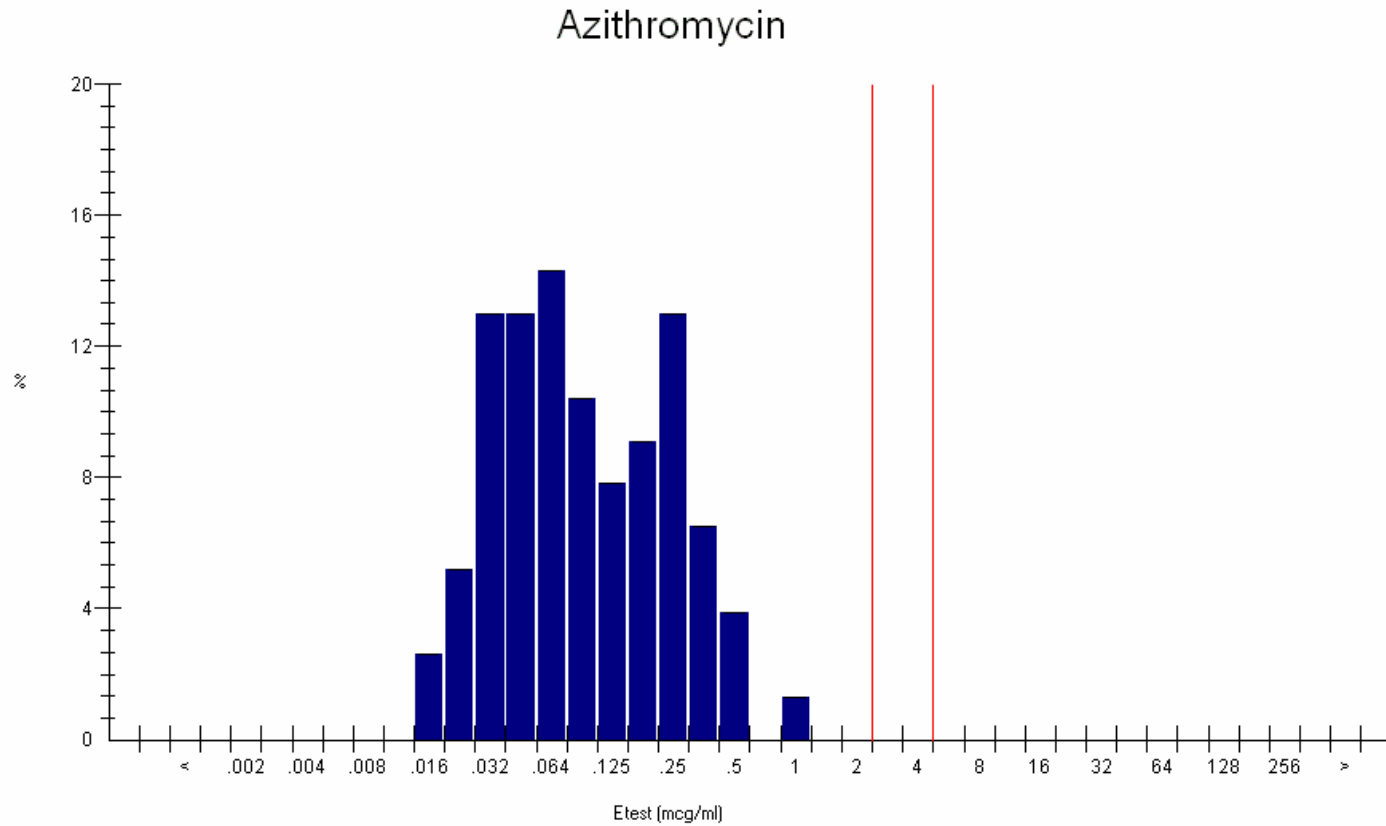
# *Neisseria gonorrhoeae*, MIC of ceftriaxone 2010

HUSLAB material from Helsinki and Uusimaa Districts ( $n = 78$ )



# *Neisseria gonorrhoeae*, MIC of azithromycin 2010

HUSLAB material from Helsinki and Uusimaa Districts ( $n = 78$ )



## *Neisseria meningitidis* 2008- 2010 (%R+I)

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

<b>Penicillin-I</b>	<b>0</b>
<b>Penicillin-R</b>	<b>2</b>
<b>Cephtriaxone</b>	<b>0</b>
<b>Meropenem</b>	<b>0</b>
<b>Ciprofloxacin</b>	<b>0</b>
<b>Chloramphenicol</b>	<b>0</b>
<b>n</b>	<b>43</b>

## ***Bacteroides fragilis* group 2010 (%R+I)**

HUSLAB material from Helsinki and Uusimaa Districts.

One isolate per patient (the first isolate)

*n* = 1107

<b>Metronidazole</b>	<b>0</b>
<b>Piperacillin-tazobactam</b>	<b>2</b>
<b>Imipenem</b>	<b>1</b>
<b>Clindamycin</b>	<b>56</b>
<b>Doxycycline</b>	<b>10</b>
<b>Penicillin G</b>	<b>100</b>