

HUSRES Annual Report 2012
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www.huslab.fi

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The basis of this HUSRES 2012 report is the HUSLAB/Whonet database 2012, which contains susceptibility data on more than 193.000 bacteria isolated and studied in 2012 by HUSLAB. The susceptibility interpretations are according to EUCAST 2012.

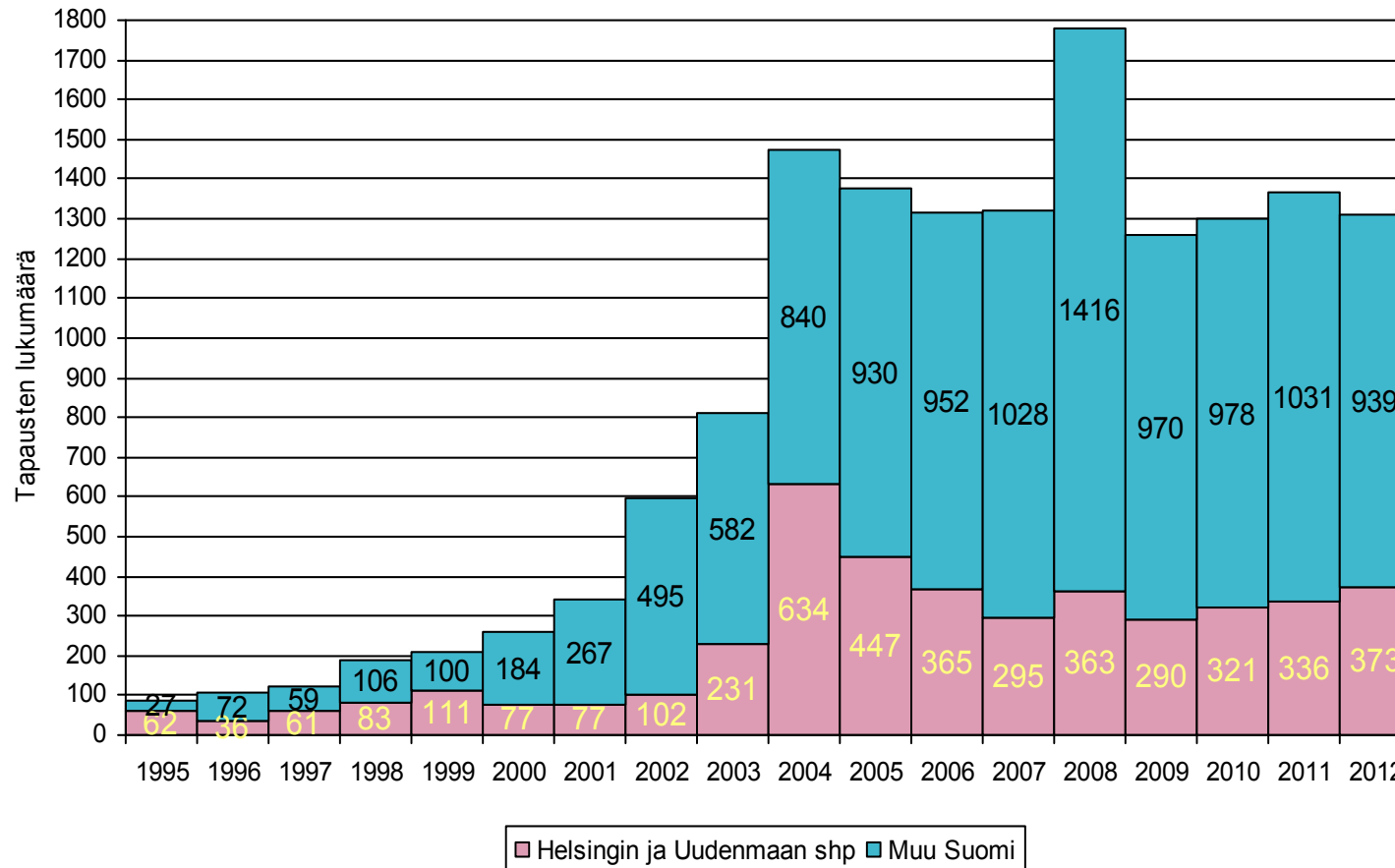
The isolates originate from patients in Helsinki University Central Hospital, other hospitals in Helsinki - Uusimaa region, as well as outpatient health centers.

HUSRES 2012 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 – 2012

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 2012 (%R+I)

Pus and blood isolates from 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 (8 hosp) | 2261 | 4 | 8 | 6 | 3 | 0 | 8 | 4 | 0 | 0 | 0 |
| Blood isolates | 357 | 2 | 7 | 6 | 4 | 1 | 7 | 2 | 0 | 0 | 0 |
| Jorvi Hospital | 658 | 3 | 7 | 6 | 4 | 0 | 6 | 3 | 0 | 0 | 1 |
| Peijas Hospital | 380 | 3 | 5 | 4 | 2 | 0 | 6 | 3 | 0 | 0 | 0 |
| Hyvinkää Hosp | 357 | 2 | 6 | 5 | 2 | 1 | 7 | 3 | 0 | 0 | 0 |
| Helsinki City H | 668 | 6 | 9 | 8 | 6 | 1 | 8 | 3 | 0 | 0 | 0 |
| Outpatients | 3555 | 3 | 6 | 5 | 3 | | 7 | | | | |
| All sources | 8343 | 3 | 7 | 6 | 3 | 0 | 7 | 4 | 0 | 0 | 0 |

Coagulase-negative *staphylococci* 2012 (%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 | 1425 | 71 | 57 | 43 | 49 | 14 | 58 | 21 | 21 | 0 | 39 |
| St. haemolyticus | 31 | 100 | 94 | 48 | 97 | 7 | 19 | 10 | 19 | 0 | 77 |
| St. lugdunensis | 105 | 3 | 13 | 11 | 3 | 0 | 8 | 3 | 1 | 0 | 3 |

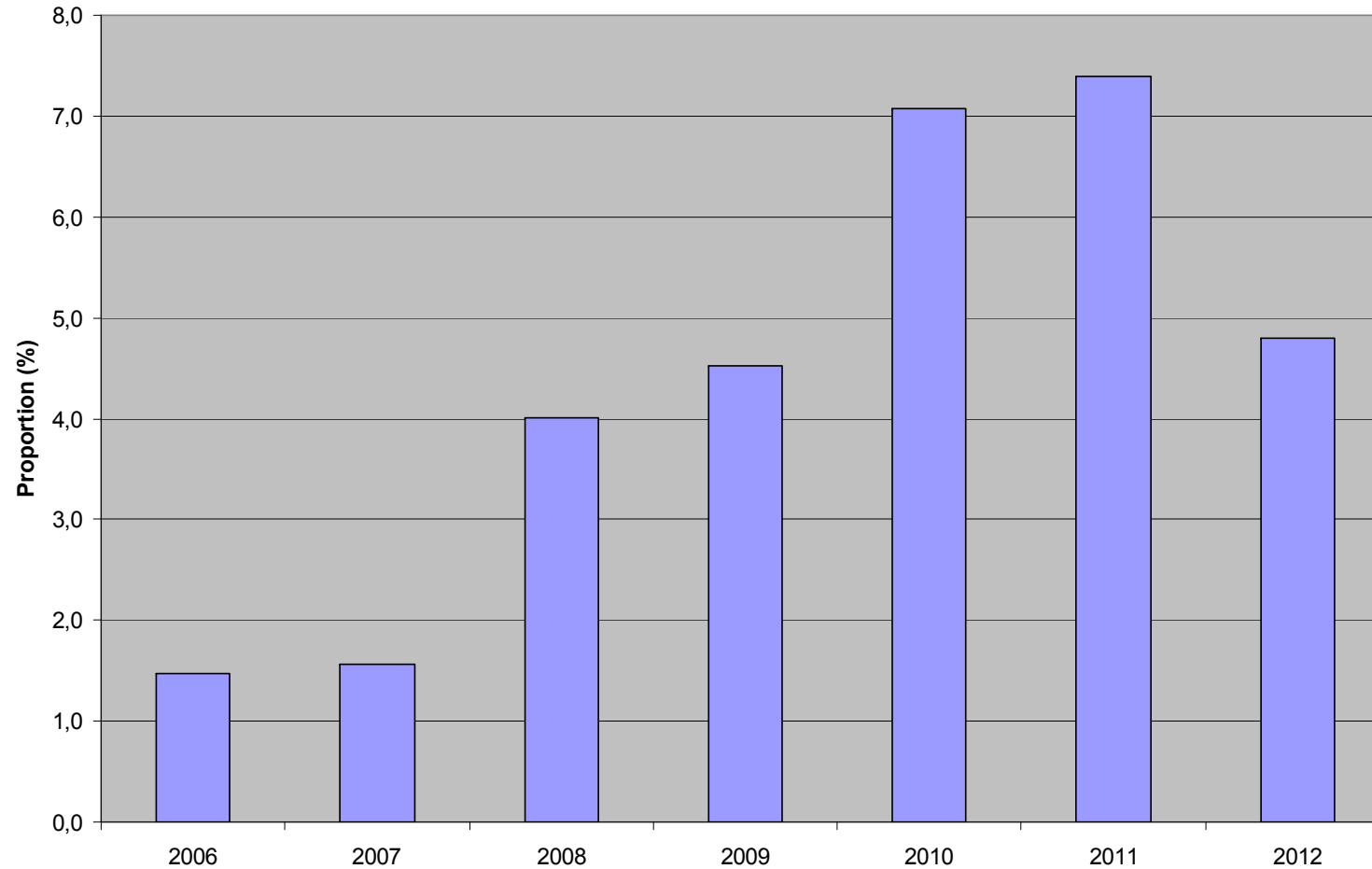
Streptococcus pneumoniae 2012 (%R+I)

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

| | All | Blood |
|-----------------|-----|-------|
| Penicillin - R | 1,1 | 0,0 |
| Penicillin - I* | 17 | 17 |
| Ceftriaxone - R | 0,1 | 0 |
| Ceftriaxone - I | 1,4 | 0 |
| Erythromycin | 25 | 25 |
| Clindamycin | 13 | 9 |
| Doxycycline | 17 | |
| Sulphamet-Trim. | 21 | |
| Imipenem | | 0,0 |
| Levofloxacin | | 2 |
| Moxifloxacin | | 1 |
| Telithromycin | | 8 |
| <i>n</i> | 704 | 204 |

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

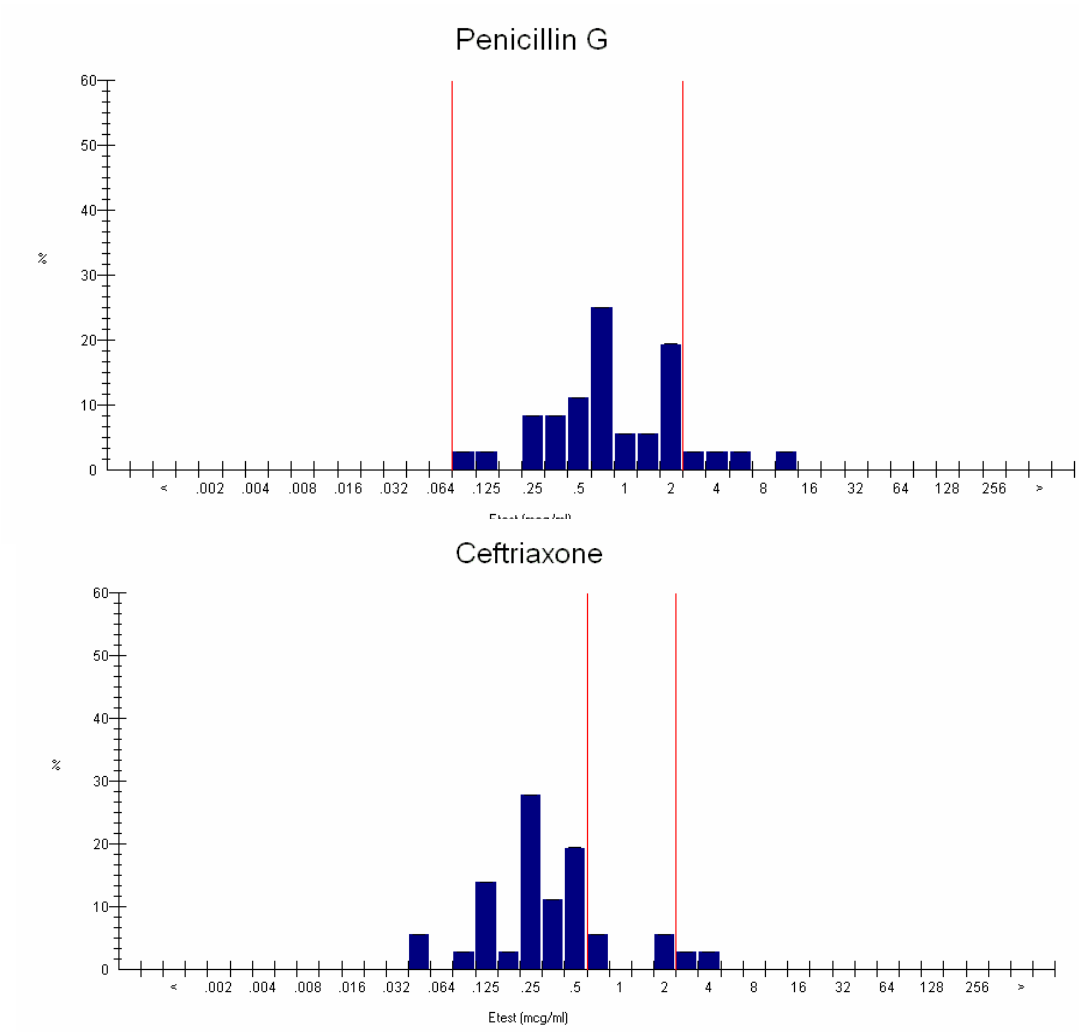
Multiresistant pneumococci* 2006 – 2012 (HUSLAB)



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

Multiresistant pneumococci* 2012 (HUSLAB)

MIC distribution for penicillin G and ceftriaxone ($n = 36$)



* Pen MIC > 0.064 μ g/ml and non-susceptibility to Ery, Cli, Dox and SxT.

Beta-hemolytic streptococci 2012 (%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 | 5 | 12 | 12 |
| Clindamycin | 4 | 11 | 11 |
| | | | |
| n | 9744 | 4862 | 3836 |

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

***Streptococcus viridans* group, blood isolates 2012**

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

| | |
|------------------------------|-----------|
| Penicillin -I | 6 |
| Penicillin -R | 2 |
| Ceftriaxone -I | 0 |
| Ceftriaxone -R | 1 |
| Erythromycin I+R | 23 |
| Clindamycin I+R | 10 |
| Gentamycin -high res. | 0 |
| Vancomycin | 0 |

n = 155

Str. anginosus [milleri] group 2012 (%R+I)

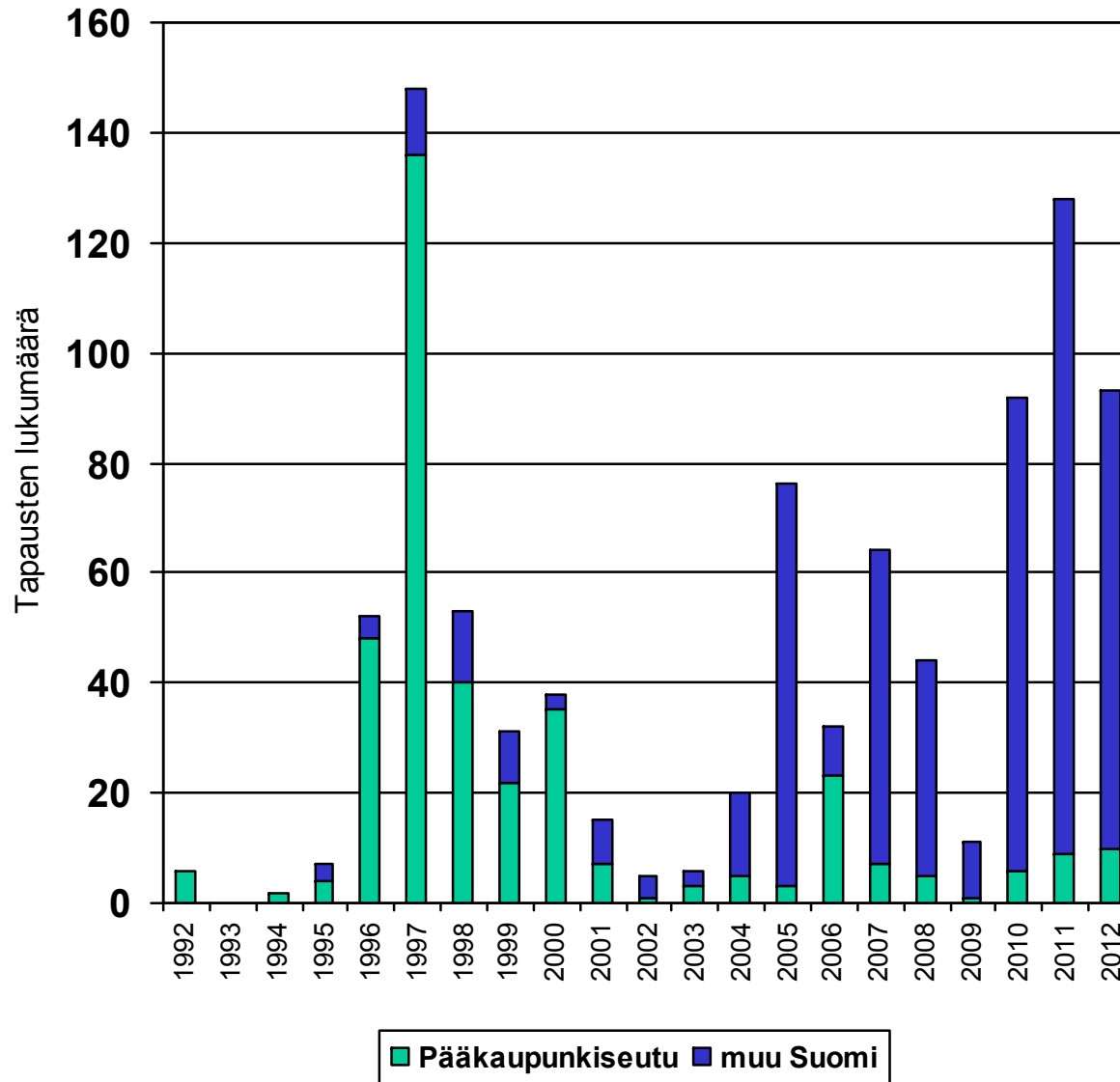
Pus and blood isolates, HUSLAB material from Helsinki and Uusimaa Districts.
One isolate per patient (the first isolate).

n = 667

| | |
|----------------------------|----------|
| Penicillin | 0 |
| Cephalospor. I gen. | 0 |
| Erythromycin | 7 |
| Clindamycin | 6 |
| Vancomycin | 0 |

VRE cases in Finland 1992-2012

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



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E. faecalis and *E. faecium* 2012

%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 |
| Ampicillin | 0 | 0 | 0 | 97 | 92 | 97 |
| Imipenem | 5 | 3,5 | | 98 | 97 | |
| Pip/taz | 6 | 6 | | 98 | 97 | |
| Linezolid-I | 0 | 0 | | 0 | 0 | |
| Linezolid-R | 0 | 1 | | 0 | 0 | |
| Vancomycin | 0 | 0 | 0 | 0,3 | 0 | 0 |
| Gentam. (hi) | | 18 | | | 7 | |
| Levofloxacin | | 53 | 23 | | 100 | 97 |
| Nitrofurantoin | | | 0 | | | 91 |
| SuTri | | | 23 | | | 91 |
| <i>n</i> | 881 | 113 | 3770 | 313 | 62 | 861 |

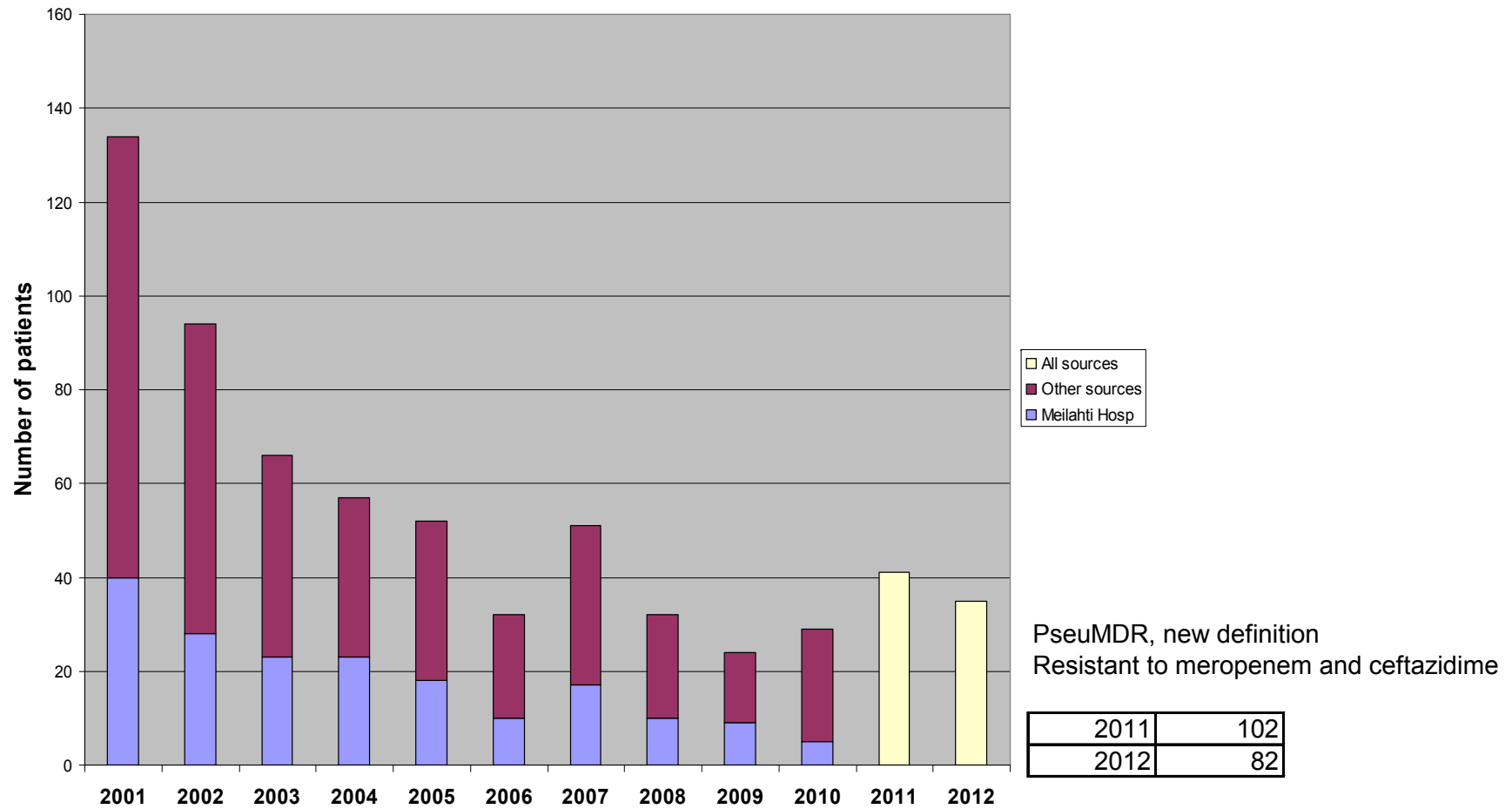
Pseudomonas aeruginosa 2012 (%R+I)

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 | 198 | 12 | 21 | 15 | 5 | 6 | 19 |
| Töölö | 172 | 6 | 26 | 16 | 5 | 3 | 20 |
| Helsinki City hospitals | 167 | 8 | 20 | 14 | 3 | 1 | 21 |
| Jorvi Hospital | 183 | 8 | 21 | 15 | 6 | 4 | 24 |
| Peijas Hospital | 83 | 11 | 16 | 8 | 5 | 7 | 22 |
| Childrens´ Hospital | 40 | 10 | 20 | 8 | 3 | 10 | 20 |
| Uusimaa regional hospitals | 199 | 9 | 16 | 10 | 6 | 4 | 17 |
| Outpat. in Health Cntrs | 648 | 3 | 10 | 7 | 5 | 3 | 13 |

Ps. aeruginosa, MDR strains 2001-2012*

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



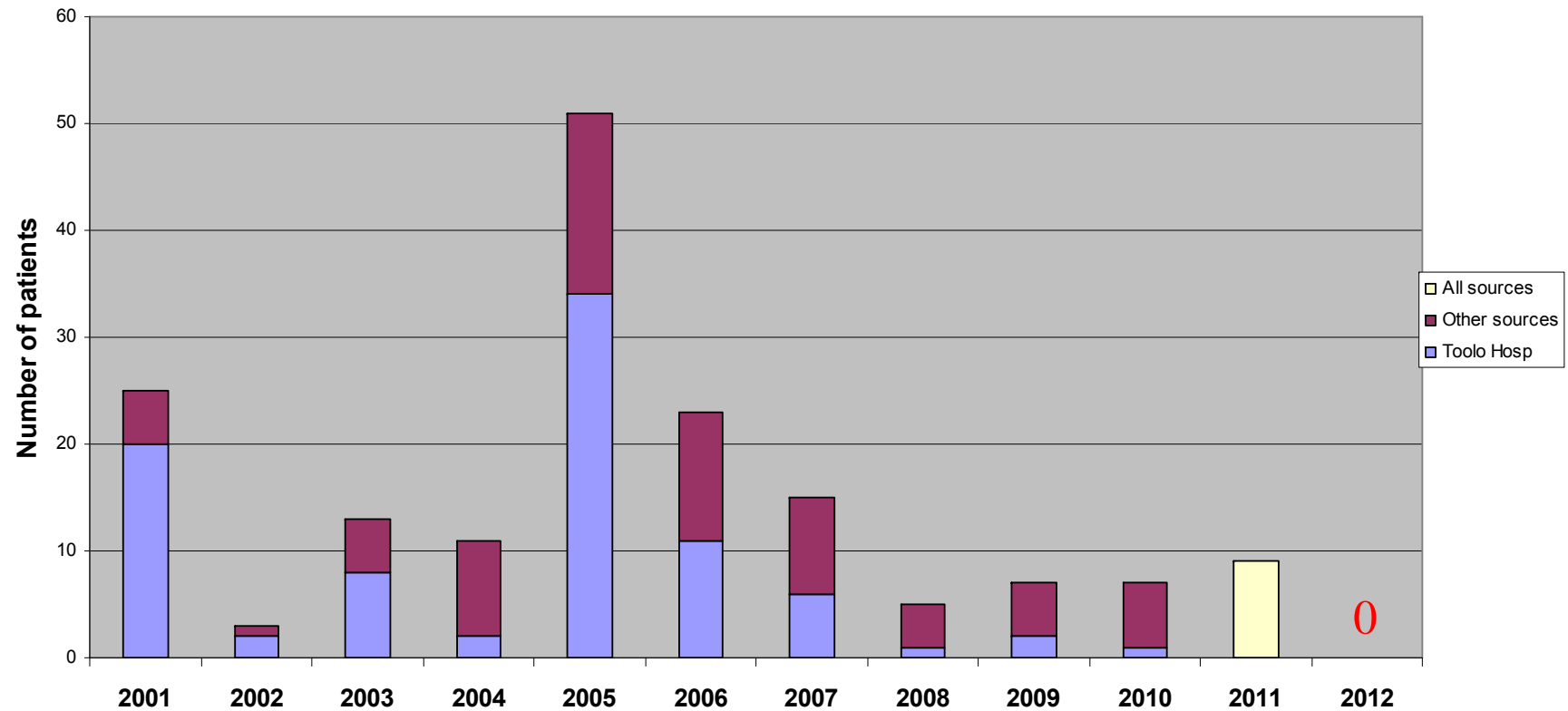
Acinetobacter spp. and *S. maltophilia* 2012 (%R+I)

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

| | n | Mero | Pi-Tz | Tob | Levo | SuTri |
|-----------------------|------------|-------------|--------------|------------|-------------|--------------|
| Acinetobacter | 168 | 4 | 6 | 4 | 6 | 6 |
| S. maltophilia | 217 | R | R | R | 19 | 3 |

Acinetobacter spp., MDR strains*

*Nonsusceptibility to meropenem, tobramycin and piperacillin-tazobactam
HUSLAB material from Helsinki and Uusimaa District.



Acinetobacter spp., MDR strains*

HUSLAB material from Helsinki and Uusimaa District.

AcinMDR, new definition:

Resistant to meropenem and at least two from the following:
ceftazidime, fluoroquinolone, aminoglycoside, ampicillin/sulbactam

| | |
|------|----|
| 2011 | 14 |
| 2012 | 2 |

Enterobacteriaceae 2012 (%R+I)

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

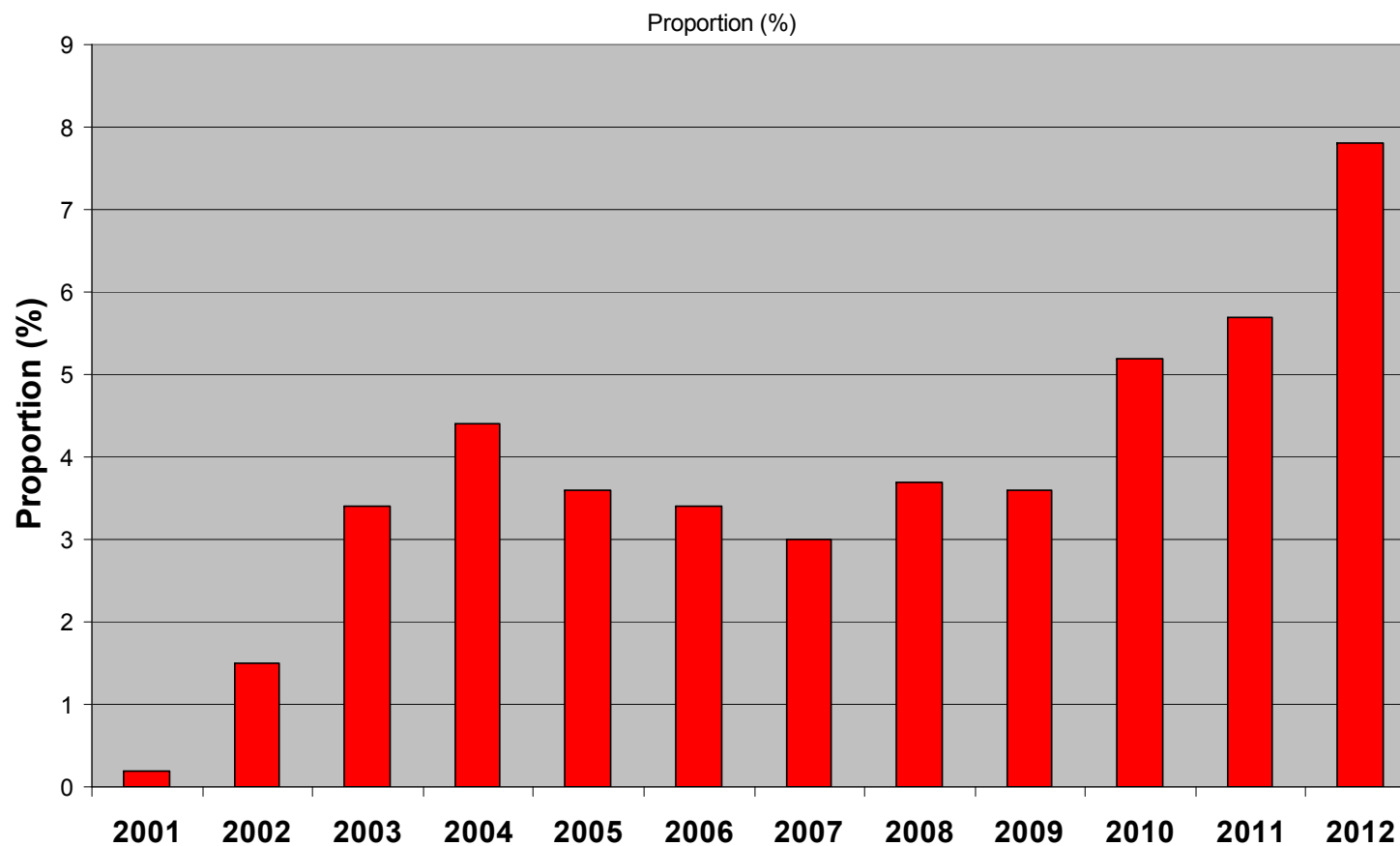
| | n | Cfur | Ctax | Pi-Tz | Tob | Levo | Mero |
|--------------------------|-------------|-------------|-------------|--------------|------------|-------------|-------------|
| E. coli | 1458 | 12 | 9 | 9* | 8 | 14 | 0 |
| Kl. pneumoniae | 331 | 10 | 5 | 5* | 1 | 5 | 0 |
| Kl. oxytoca | 202 | 10 | 6 | 9 | 1 | 2 | 0 |
| Proteus mirabilis | 116 | 3 | 3 | 1 | 1 | 3 | 0 |
| Ent. cloacae | 412 | (42) | 32** | 32** | 1 | 3 | 0,7 |
| Citrob. spp. | 145 | (29) | 21** | 21** | 0 | 2 | 0 |
| Serratia marc. | 252 | 96 | 14** | 14** | 5 | 6 | 0 |
| Proteus vulgaris | 45 | 98 | 2** | 2** | 0 | 0 | 0 |
| Morganella morg | 68 | 97 | 22** | 22** | 3 | 9 | 2 |

*: 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.

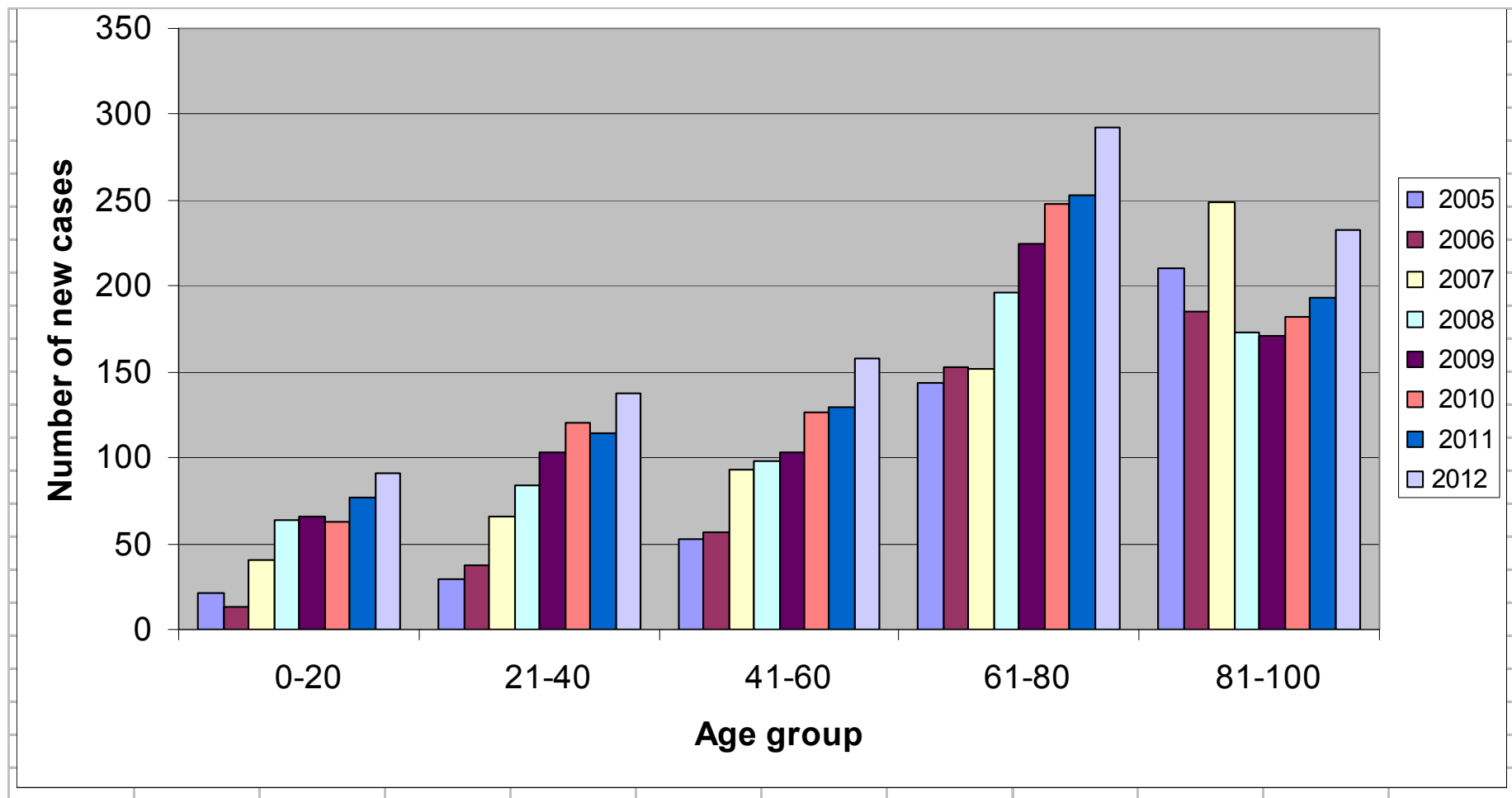
***: all cefotaxime-nonsusceptible strains (mainly *ampC* strains) reported here as nonsusceptible

Frequency of *E. coli* ESBL among all *E. coli* blood isolates. HUSLAB material 2001- 2012



One isolate per patient.

E. coli ESBL 2004 – 2012,
number of new cases by age categories in Huslab material

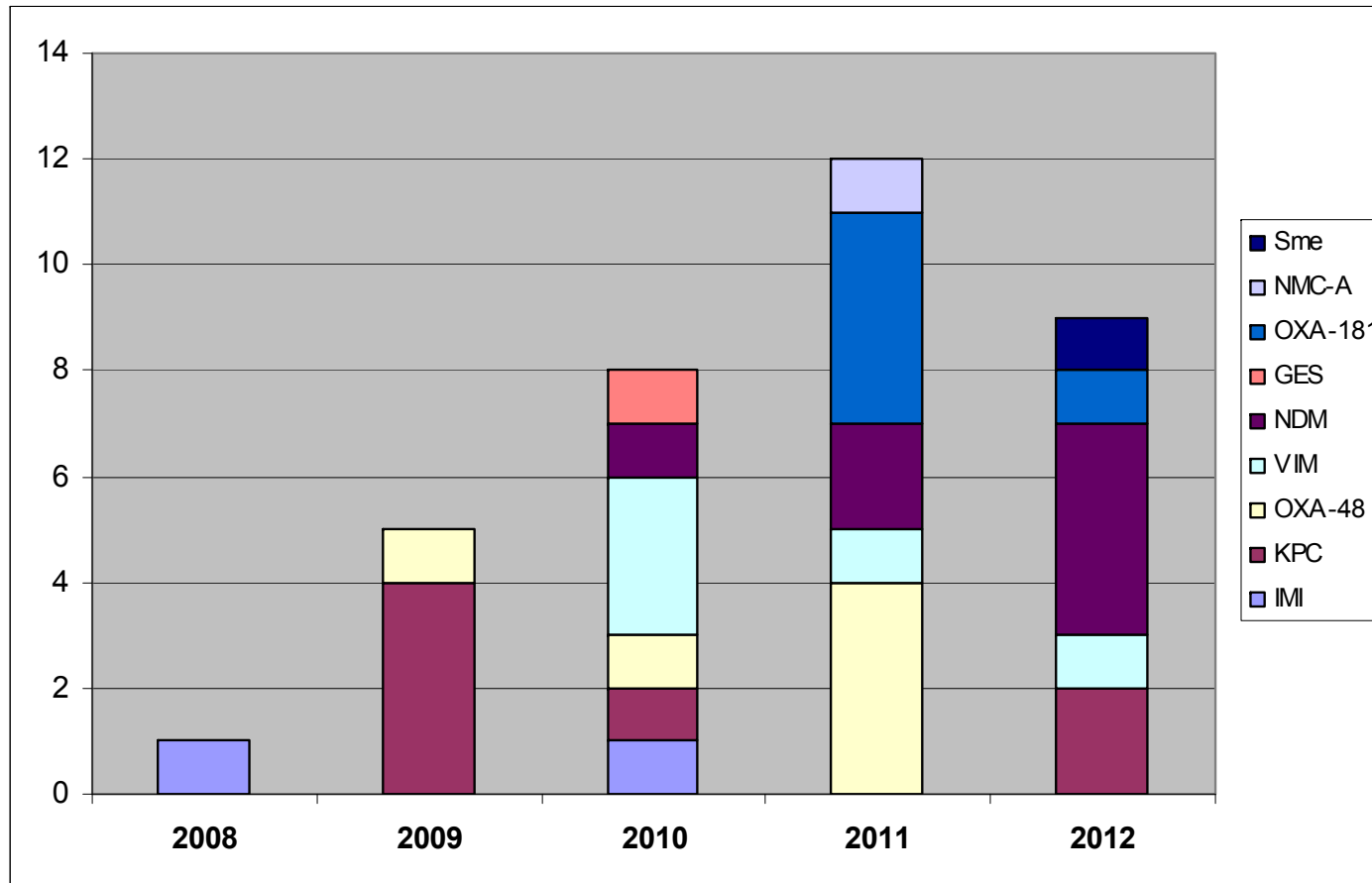


ESBL strains, resistance to non-betalactams and carbapenems 2012

% 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 | 72 |
| Tobramycin | 44 |
| Sulphatrimetoprim | 66 |
| Trimetoprim | 68 |
| Nitrofurantoin | 5 |
| Fosfomycin | 3,8 |
| Meropenem | 0 |
| Ertapenem | 2,6 |
| | |
| <i>n</i> | 1111 |

Carbapenemase-producing *Enterobacteriaceae* (CPE) isolated/received by HUSLAB 2008-2012



Jalava, Kirveskari, Vaara (HUSLAB and THL)

Enterobacteriaceae, urine isolates 2011 (%R)

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

| | E. coli | Kl. pneum. | P. mirabilis | Other |
|-------------------------------|----------------|-------------------|---------------------|--------------|
| Nitrofurantoin | 1 | 13 | 100 | 30 |
| Mecillinam | 9 | 9 | 10 | 28 |
| 1st gen. cephalospor.* | ≤ 8 | ≤ 4 | ≤ 6 | 57 |
| Cefuroxime | 6 | 4 | 1 | 34 |
| Ciprofloxacin | 10 | 3 | 2 | 4 |
| Trimetoprim | 24 | 20 | 39 | 21 |
| n | 24735 | 2831 | 851 | 2116 |

* Change in methodology during the year

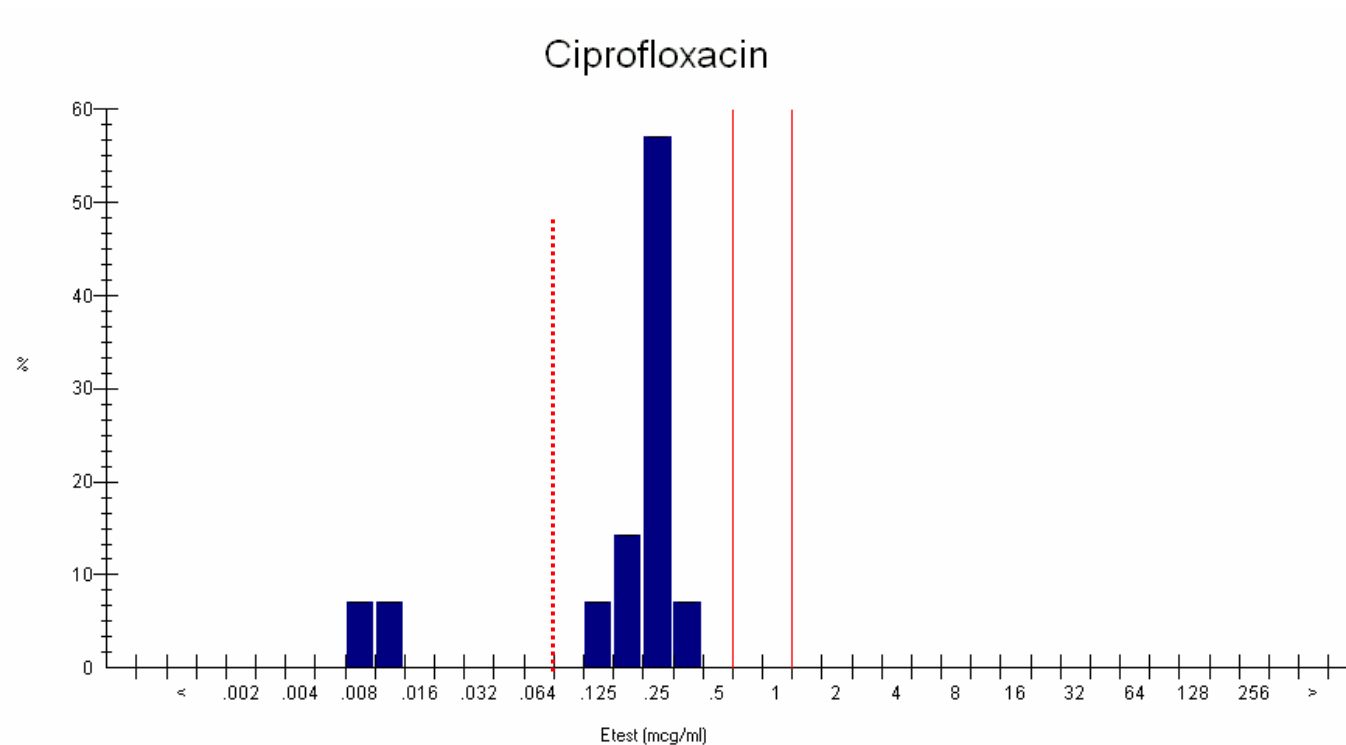
Salmonella typhi 2009 -2012, susceptibility to ciprofloxacin

HUSLAB material from Helsinki and Uusimaa Districts.

One isolate per patient (the first isolate), $n = 14$

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).



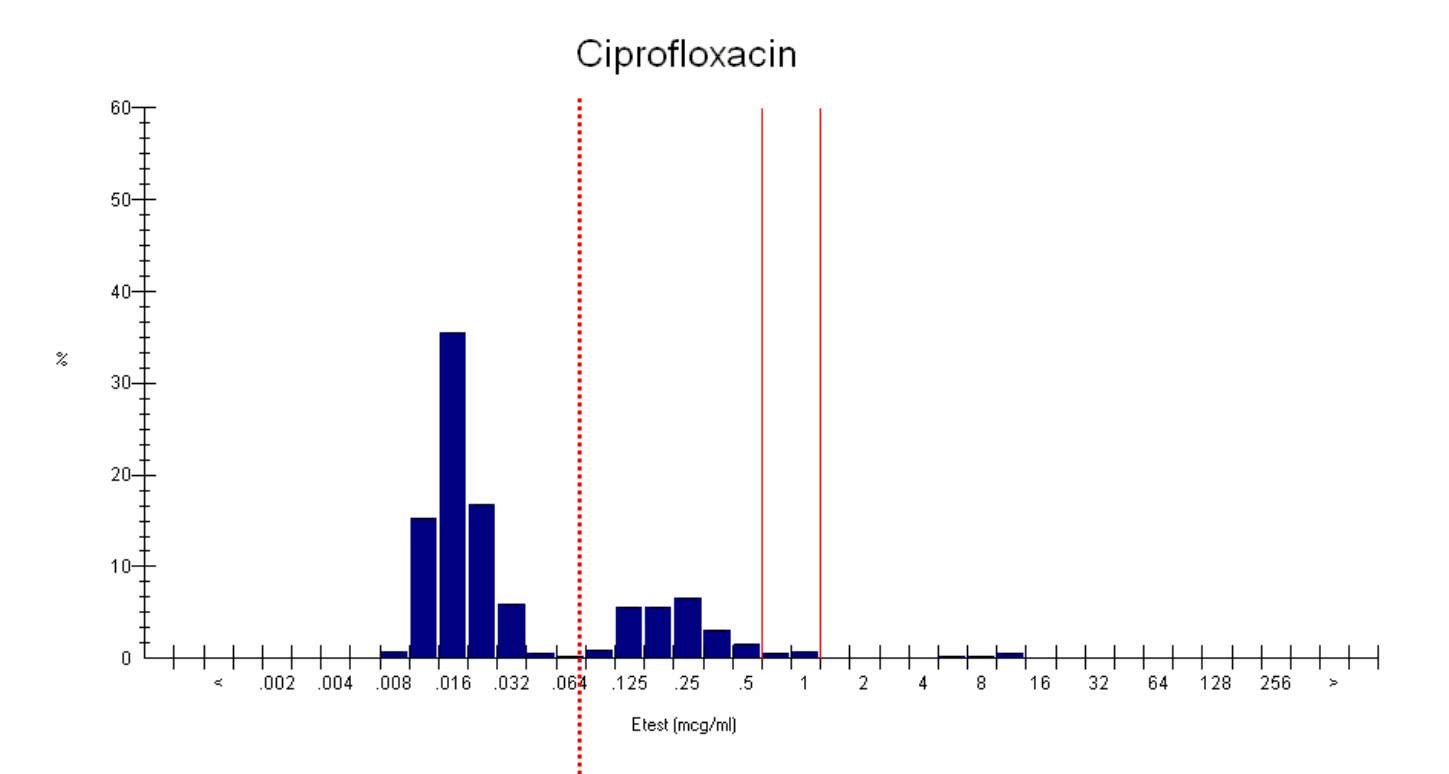
Salmonella spp 2012, susceptibility to ciprofloxacin

HUSLAB material from Helsinki and Uusimaa Districts.

One isolate per patient (the first isolate), $n = 445$

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).



Salmonella ESBL, HUSLAB material 2011 – 2012*

| | Proportion (%) |
|------|----------------|
| 2011 | 2,6 |
| 2012 | 1,9 |

*Number of strains studied (one per patient):

2011 389

2012 432

Shigella spp. 2012 (%R+I)

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

n = 37

| | |
|--------------------------|-----------|
| Ampicillin | 30 |
| Ceftriaxone* | 0 |
| Ciprofloxacin | 49 |
| Sulphatrimetoprim | 95 |
| Doxycycline | 81 |

H. influenzae & *M. catarrhalis* 2012 (%R+I)

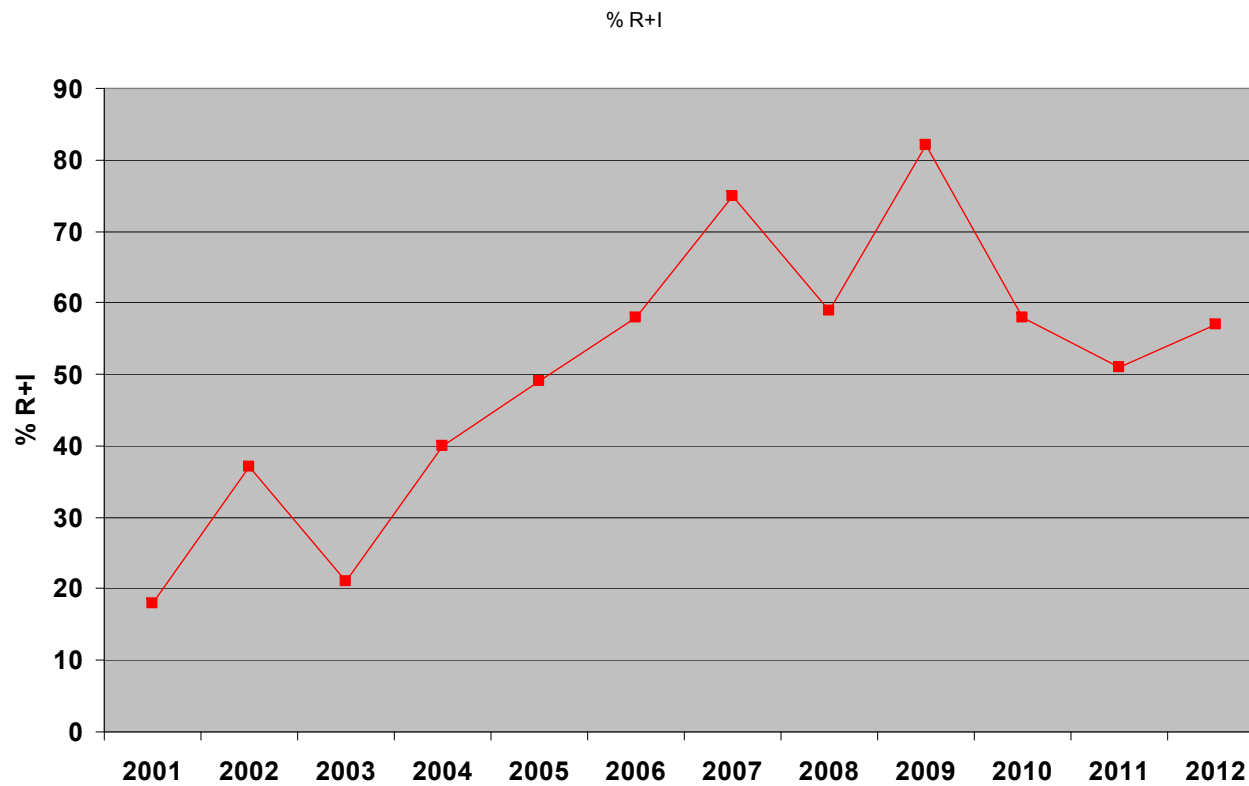
HUSLAB material from Helsinki and Uusimaa Districts.
One isolate per patient (the first isolate).

| | H. influenzae | M. catarrh. |
|--------------------------|----------------------|--------------------|
| Ampicillin | 19 | 100 |
| Amoxycill-clavul. | 1 | 0 |
| Cefuroxime | 3 | 0 |
| Doxycycline | 2 | 2 |
| Ciprofloxacin | 0 | 1 |
| Sulphameth-trim. | 28 | 5 |
| Azithromycin | 97 | 10 |
| | | |
| n | 679 | 359 |

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

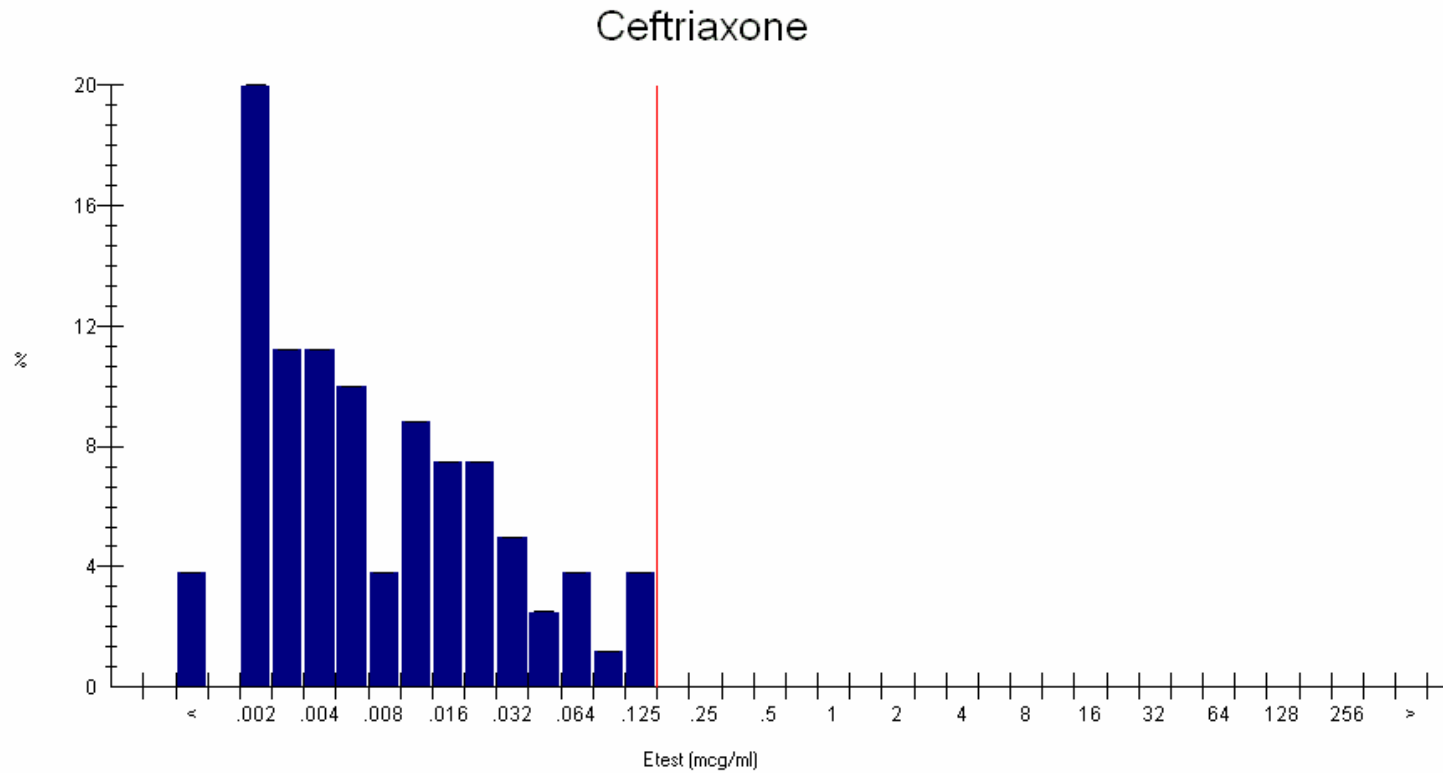
Neisseria gonorrhoeae, resistance to ciprofloxacin 2001-2011

HUSLAB material from Helsinki and Uusimaa Districts (2012, $n = 80$)



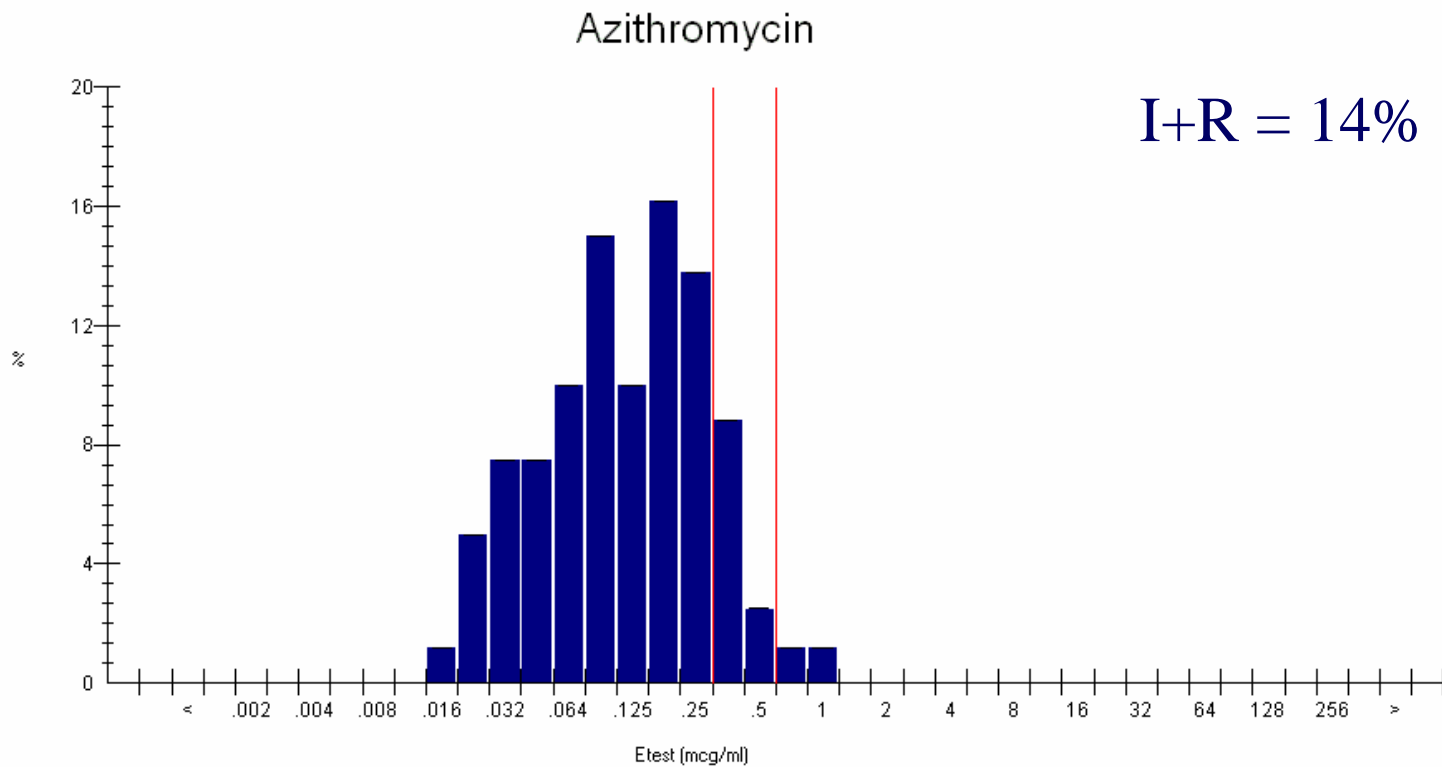
Neisseria gonorrhoeae, MIC of ceftriaxone 2012

HUSLAB material from Helsinki and Uusimaa Districts ($n = 80$)



Neisseria gonorrhoeae, MIC of azithromycin 2012

HUSLAB material from Helsinki and Uusimaa Districts ($n = 80$)



Neisseria meningitidis 2010 - 2012 (%R+I)

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

| | |
|------------------------|-----------|
| Penicillin-I | 11 |
| Penicillin-R | 3 |
| Ceftriaxone | 0 |
| Meropenem | 0 |
| Ciprofloxacin | 0 |
| Chloramphenicol | 0 |
| n | 38 |

***Bacteroides fragilis* group 2012 (%R+I)**

HUSLAB material from Helsinki and Uusimaa Districts.

One isolate per patient (the first isolate)

n = 1031

| | |
|--------------------------------|------------|
| Metronidazole | 0 |
| Piperacillin-tazobactam | 1 |
| Imipenem | 1 |
| Clindamycin | 42 |
| Doxycycline | 21 |
| Penicillin G | 100 |