

HUSRES Annual Report 2008
Martti Vaara



www.huslab.fi

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The basis of this HUSRES 2008 report is the HUSLAB/Whonet database 2008, which contains susceptibility data on about 180.000 bacteria isolated and studied in 2008 by HUSLAB.

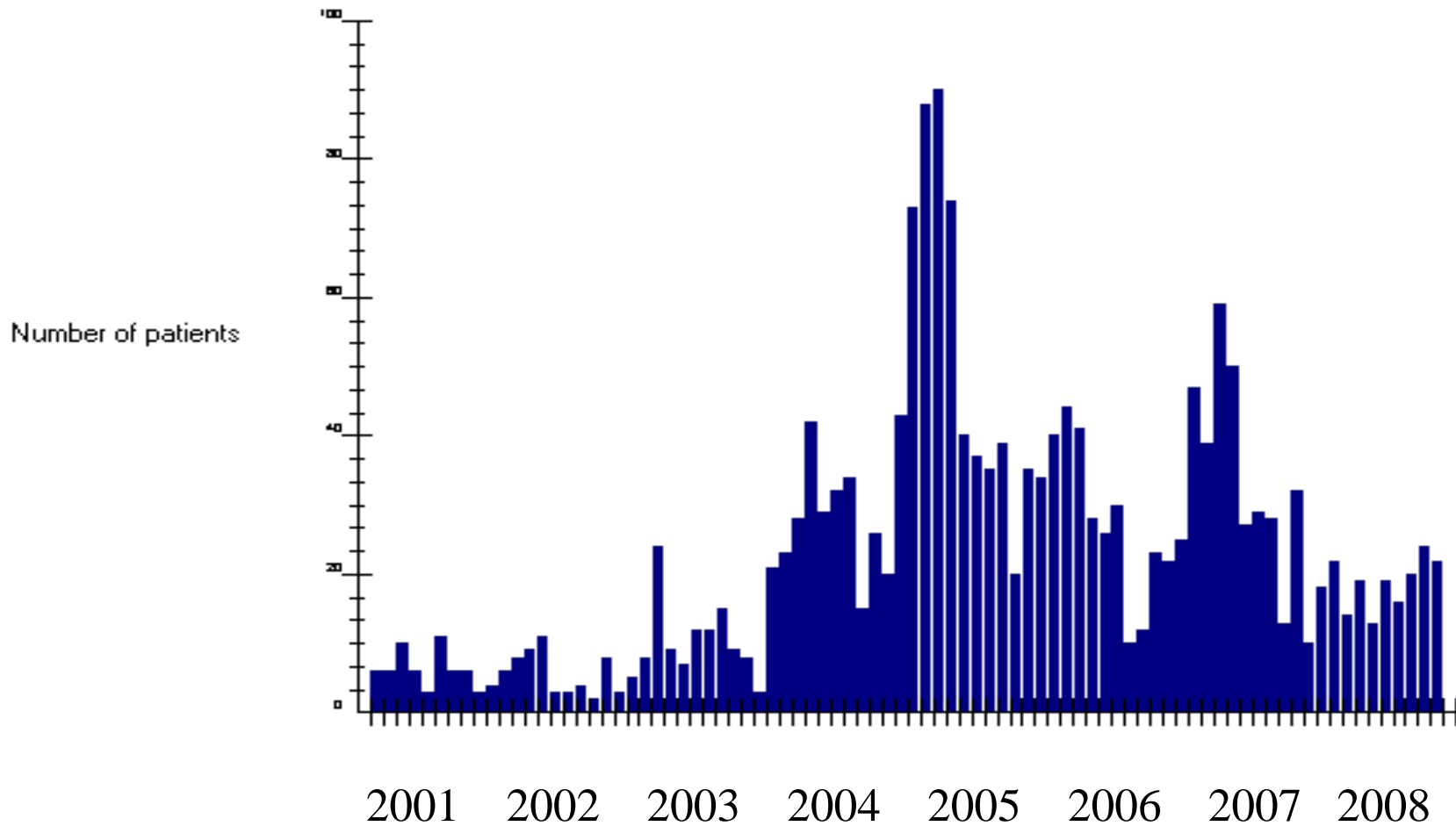
The isolates originate from patients in Helsinki University Hospital, other hospitals in Helsinki - Uusimaa region as well as outpatient health centers.

HUSRES 2008 report contains data on 31 clinically most important bacterial species/groups.

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

MRSA, new cases incl. carriers monthly 2001 – 2008 in Huslab material (Helsinki and Uusimaa District)

Staphylococcus aureus



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Staph. aureus 2008 (%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 | Tob | Net | Lnz | SxT |
|-----------------|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| HUCH (7 hosp) | 1845 | 8 | 9 | 7 | 4 | 0 | 5 | 3 | 0 | 0 | 2 |
| Blood isolates | 318 | 4 | 8 | 5 | 4 | 0 | 4 | 2 | 0 | 0 | 1 |
| Jorvi Hospital | 587 | 5 | 6 | 5 | 3 | 0 | 4 | 1 | 0 | 0 | 1 |
| Peijas Hospital | 305 | 7 | 9 | 8 | 6 | 0 | 5 | 7 | 0 | 0 | 0 |
| Helsinki City H | 608 | 4 | 9 | 6 | 4 | 0 | 7 | 3 | 0 | 0 | 2 |
| Outpatients | 2405 | 4 | 7 | 5 | 3 | | | | | | |
| All sources | 7930 | 5 | 7 | 6 | 3 | 0 | 6 | 4 | 0 | 0 | 2 |

Staph. epidermidis 2008 (%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. | 679 | 82 | 66 | 59 | 64 | 22 | 58 | 52 | 8 | 0 | 47 |
| Childrens' hosp | 139 | 87 | 70 | 60 | 24 | 9 | 76 | 56 | 10 | 0 | 59 |
| All sources | 2515 | 70 | 60 | 50 | 47 | 18 | 56 | 42 | 6 | 0 | 40 |

Streptococcus pneumoniae 2008 (%R+I)

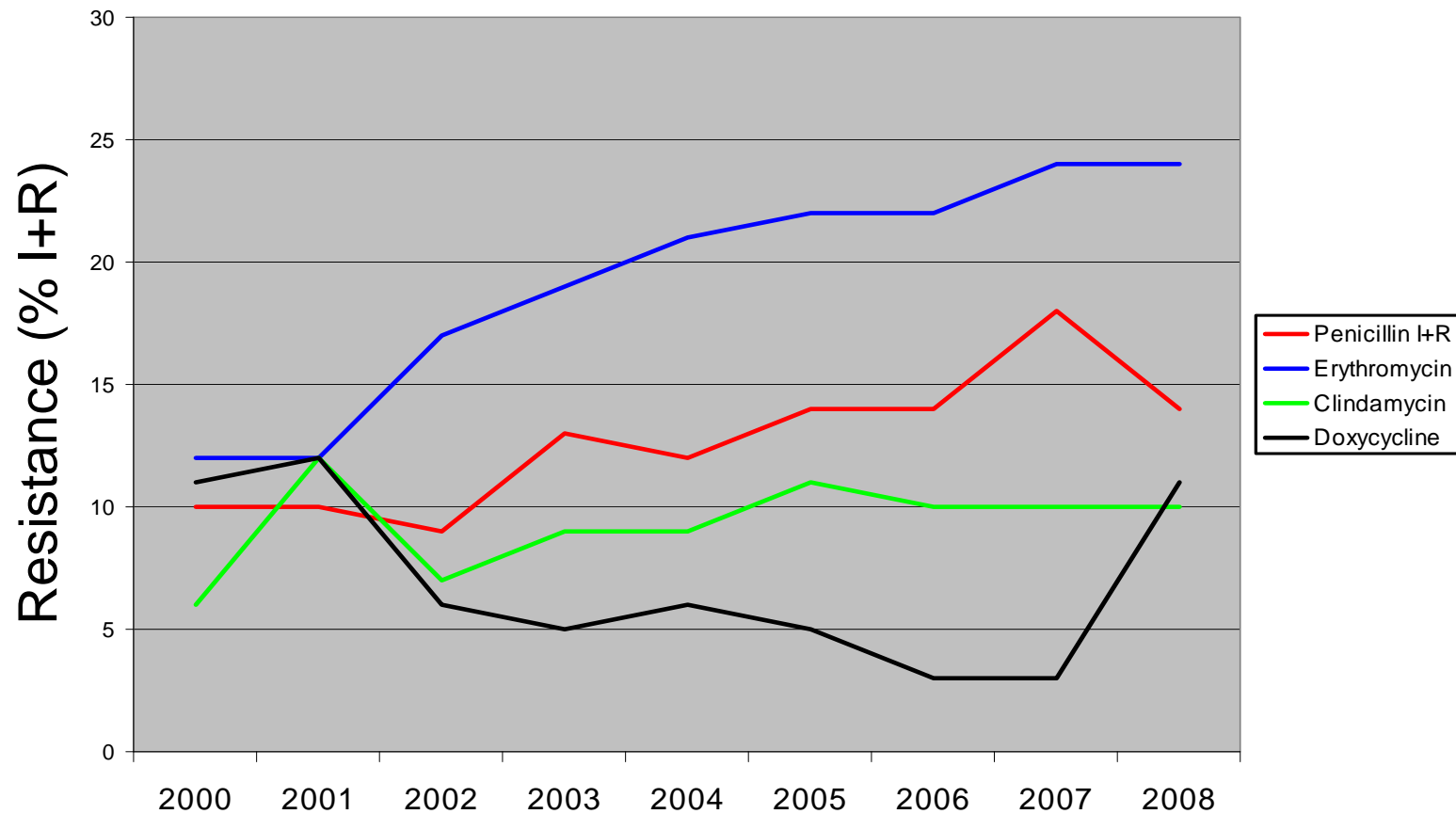
HUSLAB material from Helsinki and Uusimaa districts. One isolate per patient (the first isolate)

| | All | Blood |
|-----------------|-----|-------|
| Penicillin - R | 1,4 | 0 |
| Penicillin - I | 14 | 14 |
| Ceftriaxone - R | 0,2 | 0 |
| Ceftriaxone - I | 0,1 | 0 |
| Erythromycin | 24 | 24 |
| Clindamycin | 10 | 6 |
| Doxycycline | 11 | |
| Sulphamet-Trim. | 27 | |
| Levofloxacin | | 0 |
| Moxifloxacin | | 0 |
| Telithromycin | | 0 |
| | | |
| <i>n</i> | 949 | 219 |

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Str. pneumoniae, resistance 2000 - 2008

Huslab material



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Multiresistance among *Str. pneumoniae* 2008, multiresistance profiles displayed by ≥ 15 isolates

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

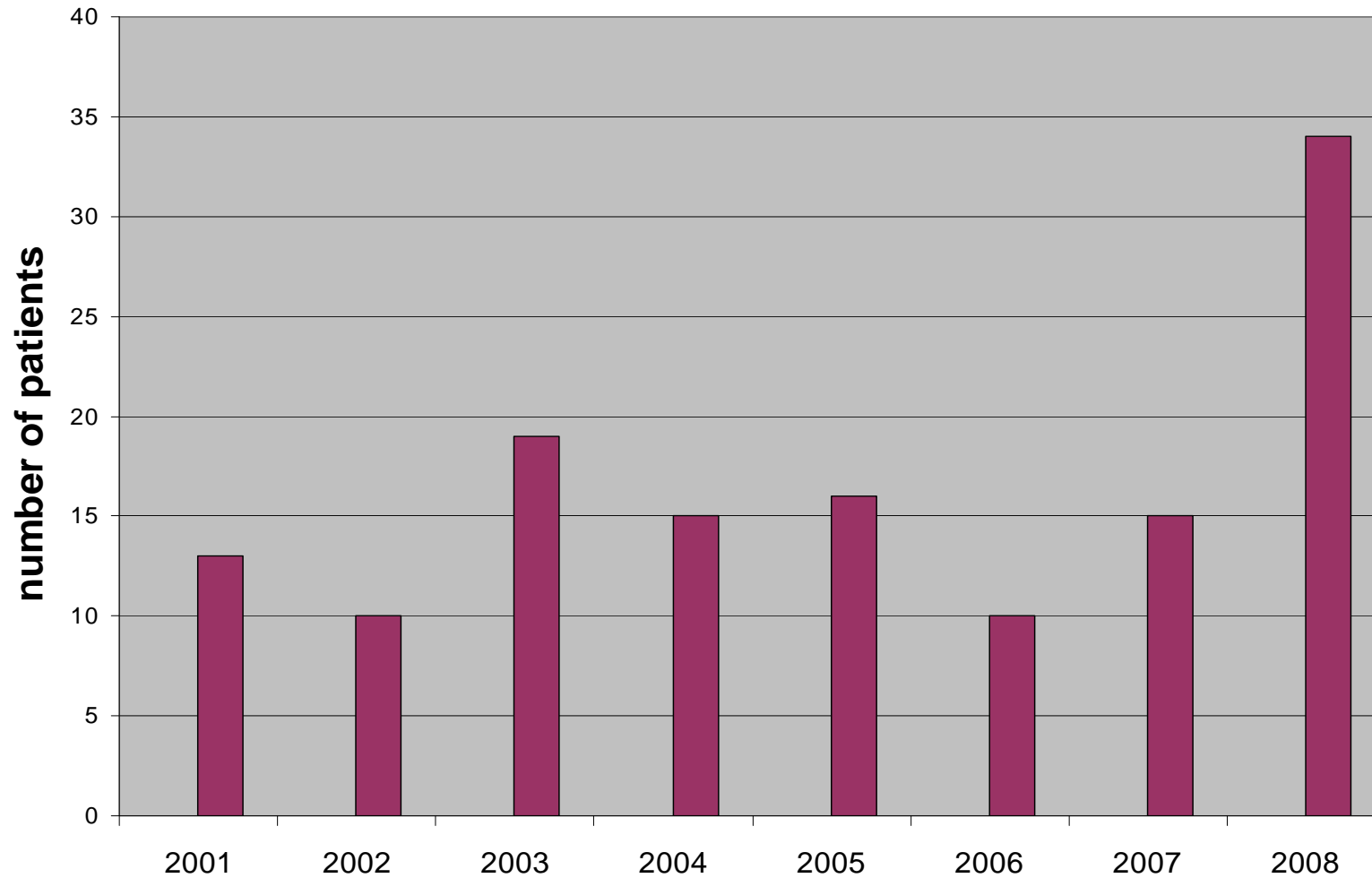
| | | | | | % freq | n of isolates with this pattern |
|------------|------------|------------|------------|------------|------------|------------------------------------|
| Pen | Ery | Cli | SxT | Dox | 3,6 | 34 |
| Pen | Ery | Cli | SxT | | 1,7 | 16 |
| Pen | Ery | | SxT | | 2,4 | 23 |

Total number of isolates studied: 949

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

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Very multiresistant pneumococci (PenR/I, Ery, Cli, SxT, Dox) HUSLAB material 2001-2008



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Beta-hemolytic streptococci 2008 (%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 | 11 | 12 |
| Clindamycin | 2 | 10 | 10 |
| n | 9679 | 3992 | 3727 |

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

Streptococcus viridans group, blood isolates 2008

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

| | |
|------------------------------|-----------|
| Penicillin -I | 14 |
| Penicillin -R | 2 |
| Ceftriaxone -I | 0 |
| Ceftriaxone -R | 0 |
| Erythromycin I+R | 28 |
| Clindamycin | 8 |
| Gentamycin -high res. | 0 |
| Vancomycin | 0 |

n = 155

Str. anginosus [milleri] group 2008 (%R+I)

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

n = 626

| | |
|----------------------------|----------|
| Penicillin | 0 |
| Cephalospor. I gen. | 0 |
| Erythromycin | 9 |
| Clindamycin | 8 |
| Vancomycin | 0 |

Enterococci 2008

%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 | 0 | 0 | | 95 | 90 | 98 |
| Imipenem | 0 | 0 | | | 94 | 90 | |
| Linezolid-I | 0 | 0 | | | 0 | 0 | |
| Linezolid-R | 0 | 0 | | | 0 | 0 | |
| Vancomycin | 0 | 0 | 0 | | 1 | 0 | 0 |
| Gentam. (hi) | | 14 | | | | 12 | |
| Levofloxacin | | 31 | | | | 82 | |
| Moxiflox MIC _{≥8} | | 31 | | | | 82 | |
| Norfloxacin | | | 26 | | | | 98 |
| Nitrofurantoin | | | 1 | | | | 88 |
| SuTri | | | 18 | | | | 92 |
| <i>n</i> | 1586 | 96 | 4389 | | 579 | 59 | 1230 |

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Pseudomonas aeruginosa 2008 (%R+I)

Pus and blood isolates. 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 | 242 | 9 | 13 | 9 | 6 | 5 | 23 |
| Töölö | 162 | 5 | 10 | 9 | 8 | 5 | 28 |
| Helsinki City hospitals | 217 | 1 | 6 | 4 | 5 | 3 | 25 |
| Jorvi Hospital | 144 | 2 | 9 | 6 | 5 | 3 | 16 |
| Peijas Hospital | 63 | 6 | 5 | 11 | 3 | 2 | 17 |
| Childrens´ | 39 | 5 | 8 | 0 | 3 | 3 | 3 |
| Uusimaa regional hospitals | 183 | 3 | 7 | 4 | 3 | 1 | 14 |
| Outpat. in Health Cntrs | 630 | 2 | 4 | 5 | 4 | 1 | 16 |

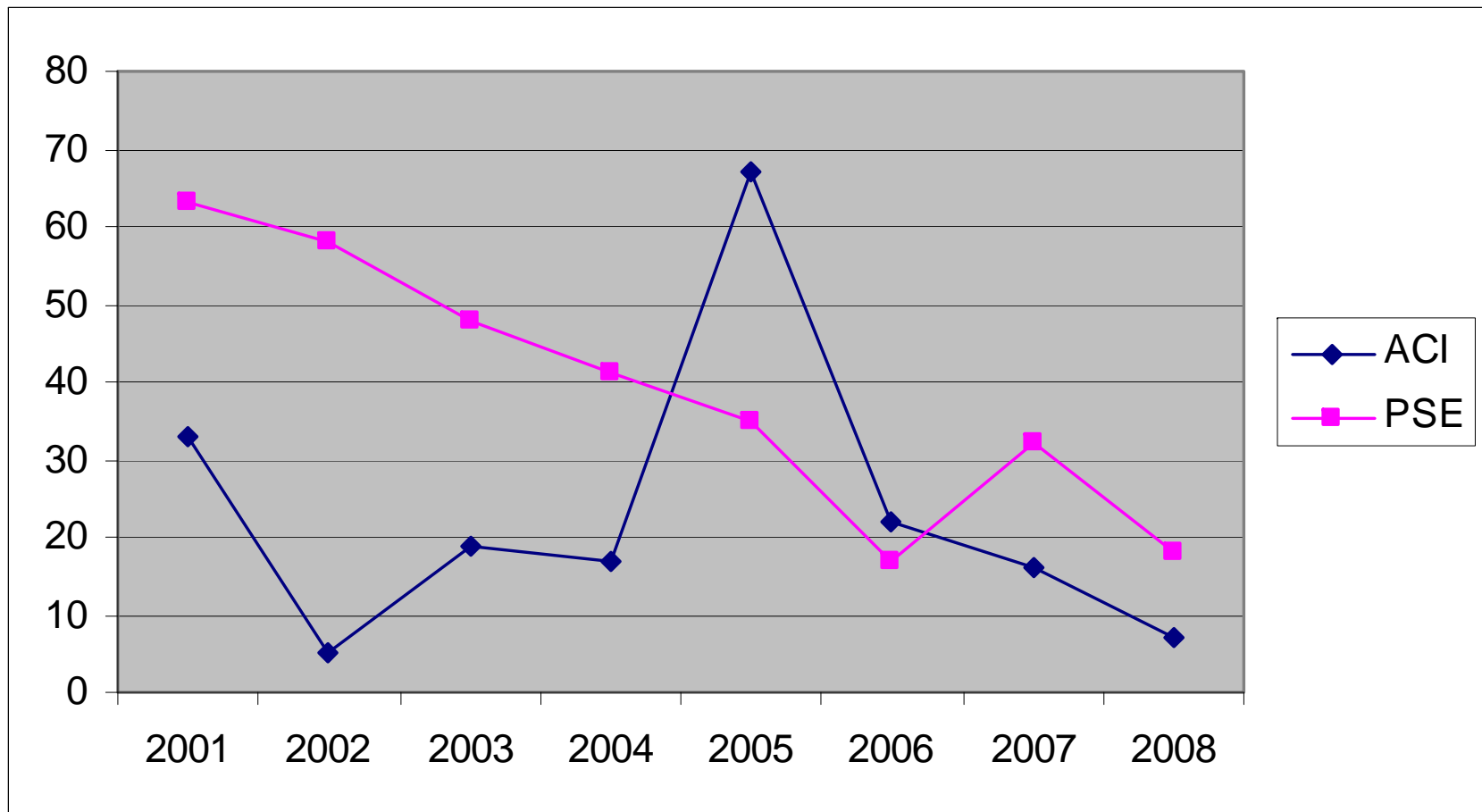
**Ps. aeruginosa in Meilahti hospital,
frequency of isolates resistant to \geq four of the six commonly
available agents ^{a)}**

**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 | 2007 | 2008 |
|---|-------------|-------------|-------------|-------------|-------------|-------------|
| | | | | | | |
| all six (= panresistant) | 3.0 | 1 | 0,4 | 0 | 0,7 | 1,2 |
| five | 4,2 | 3,4 | 1,9 | 0,8 | 1 | 0,4 |
| four | 11,1 | 6,5 | 5,7 | 2,4 | 1,9 | 2,2 |
| | | | | | | |
| total number of isolates studied | 334 | 294 | 265 | 376 | 419 | 494 |

Ps. aeruginosa and *Acinetobacter* at HUS, the number of extremely multiresistant isolates

The total number of isolates (one per each patient) of *Pseudomonas aeruginosa* (PSE) and *Acinetobacter* (ACI) that are extremely resistant (in *Pseudomonas*, all six to five clinically used key antibiotics inert and in *Acinetobacter* (ACI, all seven to six clinically used key antibiotics inert).



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Acinetobacter spp. 2008 (%R+I)

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

| Hospital | n | Ctaz | Mero | Pi-Tz | Tob | Levo | SuTri |
|---------------|-----|------|------|-------|-----|------|-------|
| Meilahti | 63 | 7 | 3 | 8 | 3 | 6 | 19 |
| Töölö | 76 | 13 | 1 | 7 | 1 | 5 | 9 |
| Other sources | 114 | 5 | 0 | 8 | 2 | 2 | 4 |

Acinetobacter spp. in Töölö hospital 2002 - 2008

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 |
| 2007 | 73 | 18 | 8 | 10 | 19 | 14 | 12 |
| 2008 | 76 | 13 | 1 | 7 | 1 | 5 | 9 |

Stenotrophomonas maltophilia 2008 (%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 | Mino | Tige MIC \geq 2 | Levo | Tic-cla |
|---------------|----------|-----|------|----------------------|------|---------|
| Meilahti | 111 | 6 | 4 | | 29 | 49 |
| Töölö | 52 | 2 | 2 | | 23 | 38 |
| Childrens´ | 12 | 8 | 0 | | 9 | 50 |
| Other sources | 224 | 7 | 0 | | 17 | 43 |
| All sources | 399 | 6 | 0 | 69 | 17 | 43 |

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

Enterobacteriaceae 2008 (%R+I)

Pus and blood isolates at seven hospitals (M,T,L,K,N,Kä,Sä) in Helsinki University Central Hospital. One isolate per patient (the most resistant)

| | n | Cfur | Ctax | Pi-Tz | Tob | Levo | Mero |
|--------------------------|-------------|-----------|-----------|-------------|----------|-----------|------------|
| E. coli | 979 | 11 | 8 | 8* | 8 | 13 | 0 |
| Kl. pneumoniae | 187 | 13 | 5 | 5* | 3 | 5 | 0 |
| Kl. oxytoca | 147 | 12 | 3 | 3* | 0 | 1 | 0 |
| Proteus mirabilis | 86 | 0 | 0 | 0 | 2 | 0 | 0 |
| Ent. cloacae | 336 | 44 | 33 | 33** | 4 | 3 | 1 |
| Enterobact. spp. | 56 | 42 | 26 | 26** | 0 | 0 | 2 |
| Citrob. spp. | 140 | 33 | 27 | 27** | 1 | 3 | 0 |
| Serratia marc. | 124 | 96 | 8 | 8** | 6 | 6 | 0 |
| Proteus vulgaris | 41 | 88 | 0 | 0 | 0 | 0 | 0 |
| Morganella morg | 51 | 88 | 8 | 8** | 2 | 4 | 0 |
| Total | 2176 | 27 | 13 | 13 | 5 | 7 | 0,1 |
| (Total 2007) | 2693 | 26 | 11 | 11 | 6 | 8 | 0,1 |
| (Total 2006) | 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

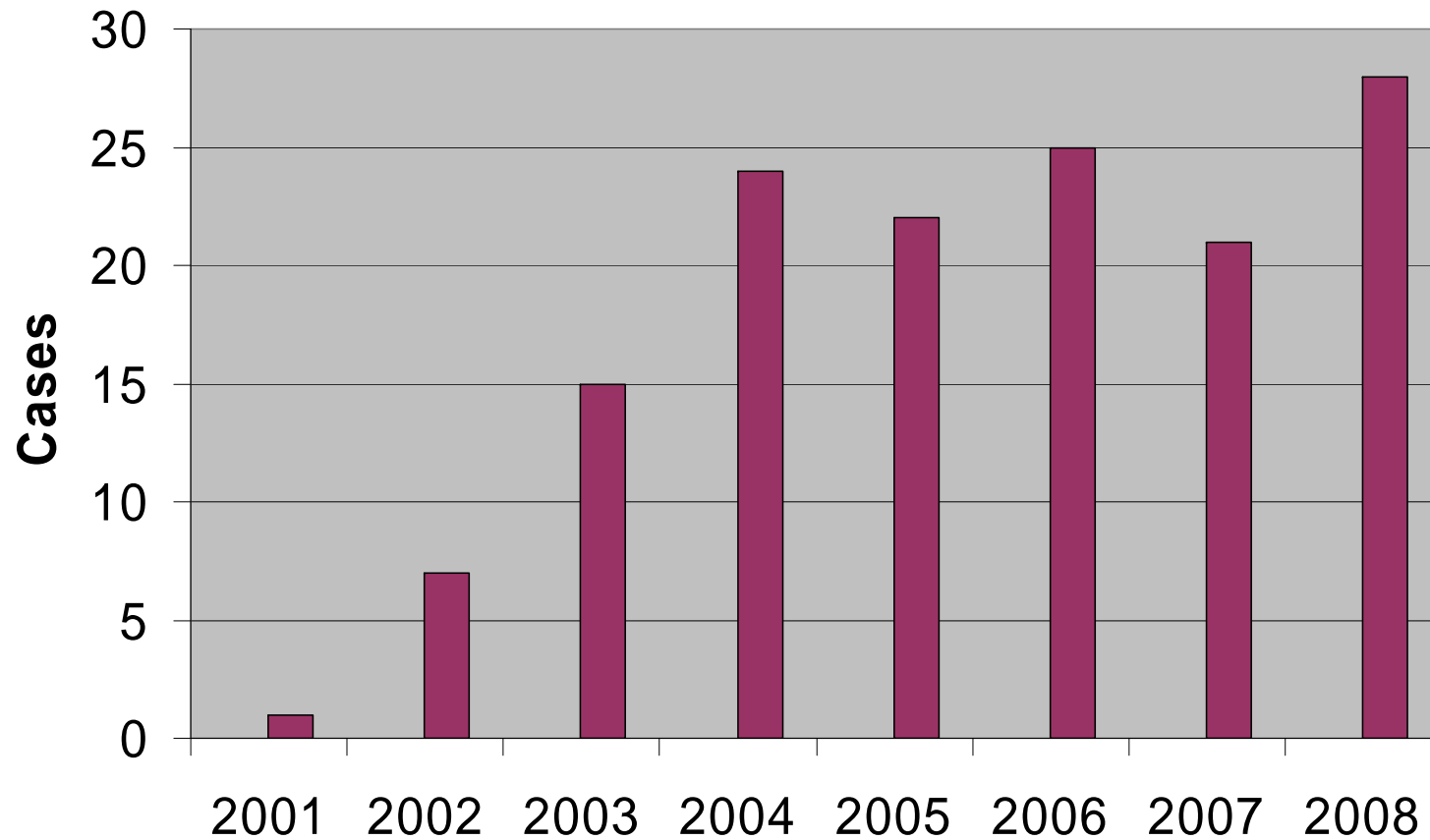
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ESBL 2008 (% frequency and number of cases) at different locations

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

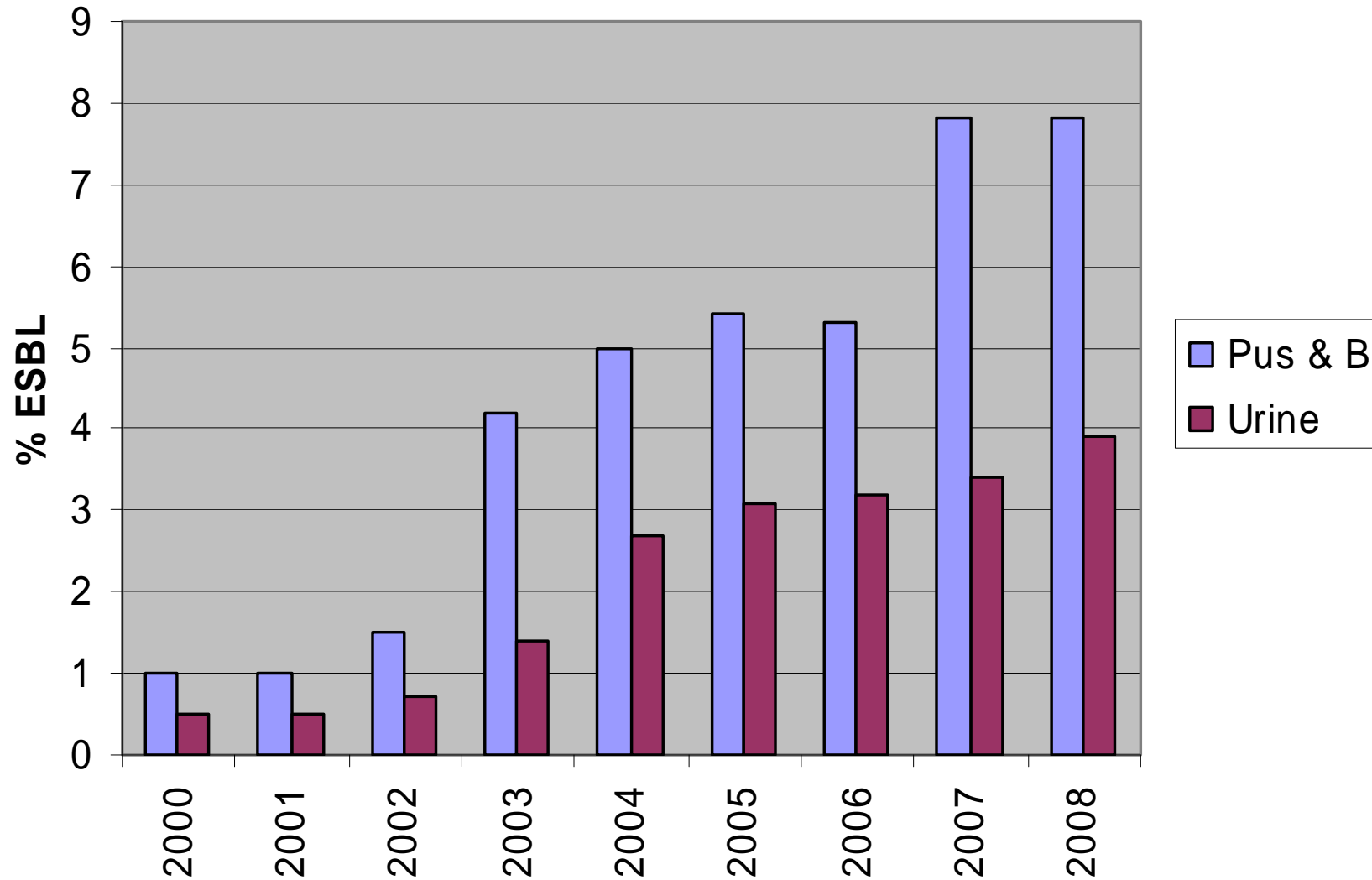
| Material | E. coli | | K. pneumoniae | |
|----------------------------|------------------------------|-------------------------|---------------|-------------------------|
| | % | no. of patients w. ESBL | % | no. of patients w. ESBL |
| | HUCH, Helsinki (7 hospitals) | 5 | 162 | 2 |
| Helsinki City hospitals | 5 | 202 | 1 | 6 |
| Helsinki City outpatients | 3 | 236 | 3 | 31 |
| Hyvinkää Regional Hospital | 2 | 26 | 2 | 4 |
| Jorvi Hospital | 3 | 37 | 2 | 3 |
| Peijas Hospital | 3 | 26 | 1 | 2 |
| All sources | 3 | 806 | 1 | 41 |

Bacteremias caused by E. coli ESBL, HUSLAB material 2001- 2008



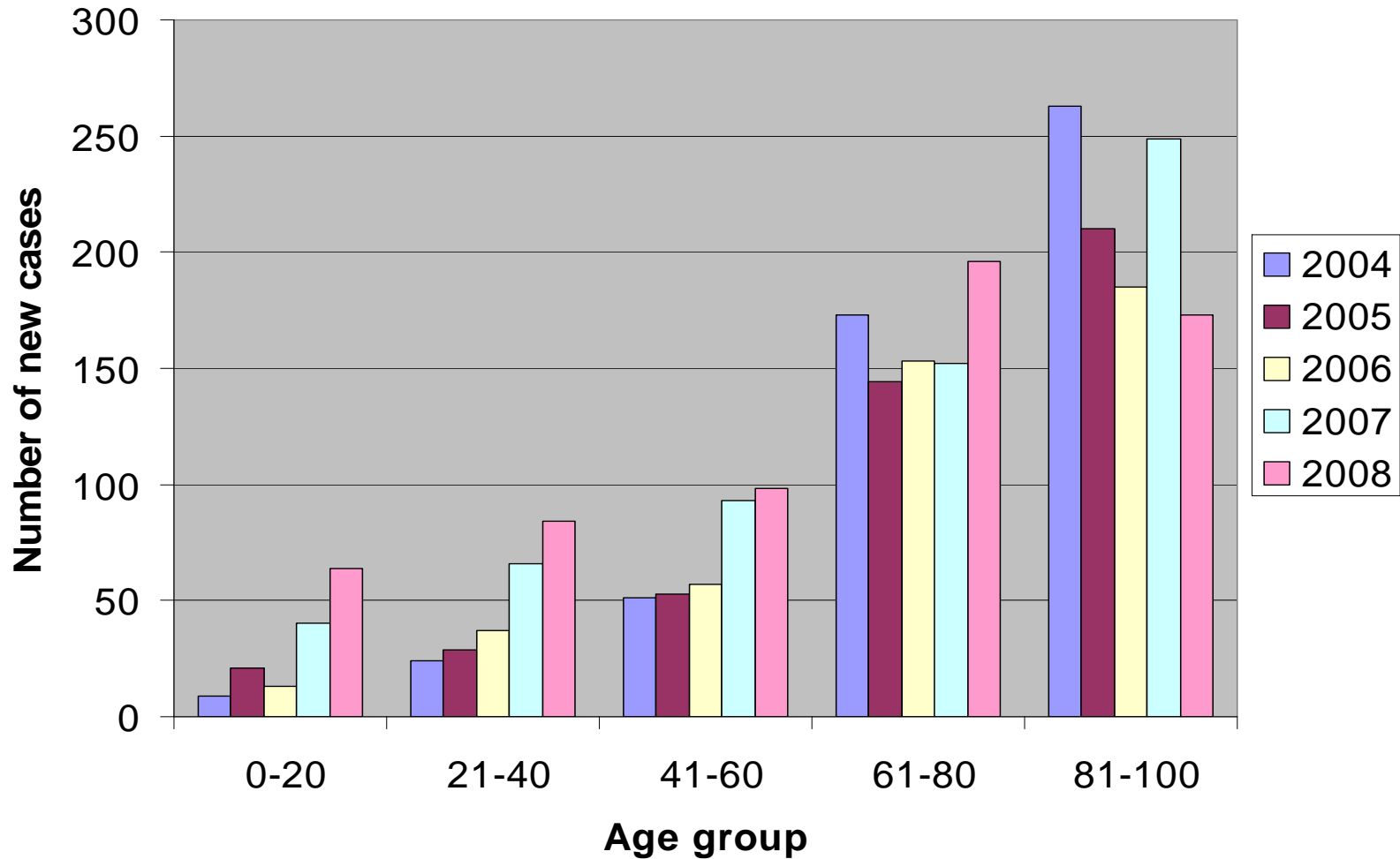
Frequency of E. coli ESBL at HUCH/Helsinki 2000 - 2008

One strain per patient



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E. coli ESBL in Huslab material 2004 – 2008, Number of new cases by age categories



ESBL strains, resistance to non-betalactams and carbapenems 2007 - 2008

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

| Antibiotic | E. coli | K. pneum. |
|-------------------|--------------------|--------------------|
| Ciprofloxacin | 84 | 64 |
| Levofloxacin | 84 | 64 |
| Norfloxacin | 79 | 61 |
| Tobramycin | 60 | 56 |
| Sulphatrimetoprim | 47 | 71 |
| Trimetoprim | 50 | 77 |
| Nitrofurantoin | 5 | 64 |
| Meropenem | 0,2 | 0 |
| Imipenem | 0 | 0 |
| Ertapenem | 0,8 | 17 |
| Tigecycline | 4 (<i>n</i> = 56) | 29 (<i>n</i> = 7) |
| <i>n</i> | 1418 | 83 |

Enterobacteriaceae, urine isolates 2008 (%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 | 99 | 29 |
| Mecillinam | 4 | 4 | 3 | 14 |
| Cephalexin | 10 | 7 | 2 | 50 |
| Norfloxacin | 8 | 2 | 2 | 3 |
| Sulphameth-trimet. | 23 | 20 | 23 | 19 |
| Trimetoprim | 22 | 21 | 40 | 21 |
| n | 22885 | 2679 | 910 | 2069 |

H. influenzae & M. catarrhalis 2008 (%R+I)

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

| | H. influenzae | M. catarrh. |
|-------------------|---------------|-------------|
| Ampicillin | 21 | 97 |
| Amoxycill-clavul. | 3 | 0 |
| Cefuroxime | 1 | 0 |
| Doxycycline | 2 | 0 |
| Ciprofloxacin | 0 | 0 |
| Sulphameth-trim. | 20 | 3 |
| Azithromycin | 0 | 1 |
| n | 708 | 344 |

Neisseria meningitidis 2006- 2008 (%R+I)

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

| | | |
|------------------------|-----------|--|
| Penicillin-I | 0 | |
| Penicillin-R | 0 | |
| Cephtriaxone | 0 | |
| Meropenem | 0 | |
| Ciprofloxacin | 0 | |
| Chloramphenicol | 0 | |
| | | |
| n | 61 | |

Neisseria gonorrhoeae 2007 - 2008 (%R+I)

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

n = 119

| | |
|----------------------|-----------|
| Ciprofloxacin | 67 |
| Ceftriaxone | 0 |
| Azithromycin | 1 |

Bacteroides fragilis group 2008 (%R+I)

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

n = 1120

| | |
|--------------------------------|------------|
| Metronidazole | 0 |
| Piperacillin-tazobactam | 1 |
| Imipenem | 1 |
| Clindamycin | 54 |
| Doxycycline | 8 |
| Penicillin G | 100 |

Prevotella spp. 2008 (% I+R)

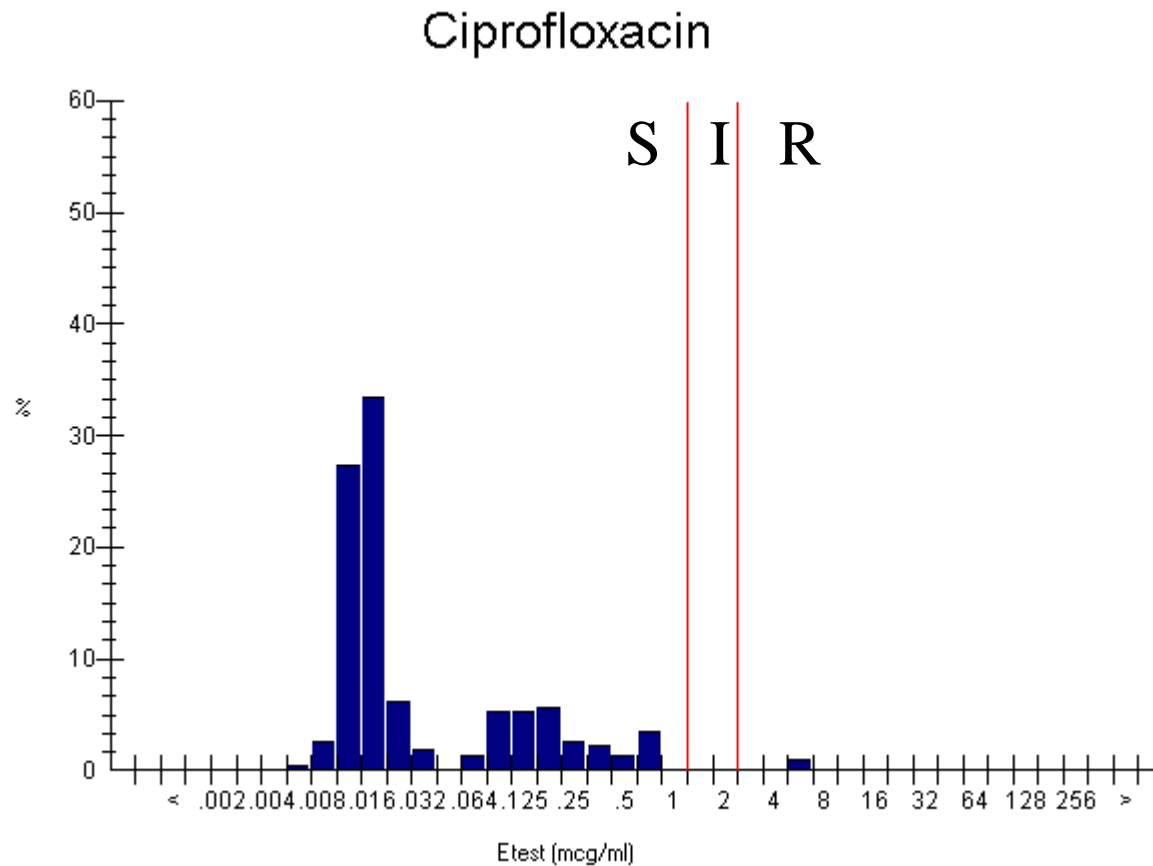
Pus isolates, HUSLAB material from Helsinki and Uusimaa Districts.
One isolate per patient (the first isolate).

n = 592

| | |
|--------------------------|-----------|
| Penicillin | 58 |
| Piperacillin-Taz. | 1 |
| Doxycyclin | 9 |
| Metronidazole | 0 |
| Clindamycin | 17 |

Salmonella 2007 -2008, susceptibility to ciprofloxacin

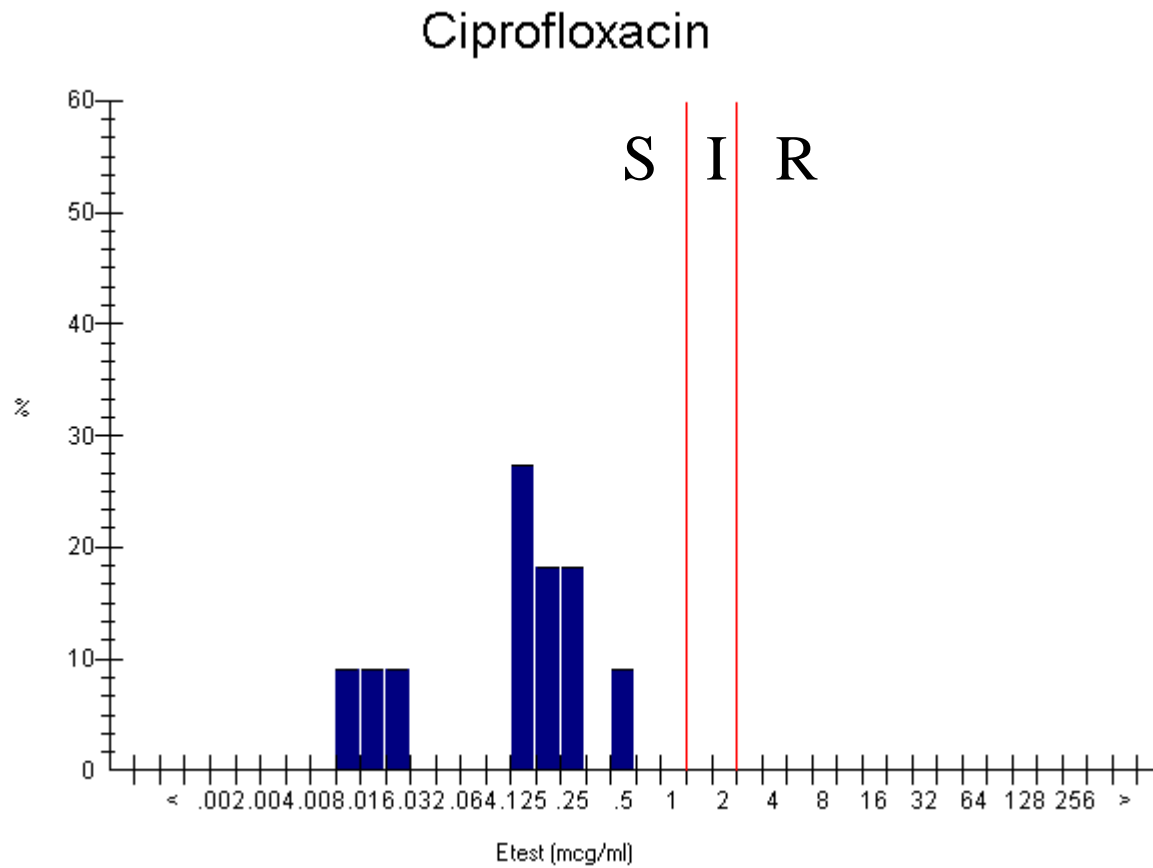
HUSLAB material from Helsinki and Uusimaa Districts.
One isolate per patient (the first isolate).
n = 917, breakpoints according to CLSI



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Salmonella typhi 2004 -2008, susceptibility to ciprofloxacin

HUSLAB material from Helsinki and Uusimaa Districts.
One isolate per patient (the first isolate).
n = 11, breakpoints according to CLSI



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Campylobacter 2008, 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 | 53 | 55 |
| Erythromycin | 3 | 3 |
| Cip + Ery | 1 | 7 |
| Cip + Ery + Dox | 0 | 5 |
| | | |
| n | 694 | 152 |