



Feidhmeannacht na Seirbhíse Sláinte
Health Service Executive

EARSS in Ireland, 2006

Results of
invasive *Klebsiella pneumoniae* infection
(blood/CSF)
surveillance

Antibiotic codes: *Klebsiella pneumoniae*

| | |
|------------|--|
| AMK | Amikacin |
| AMC | Amoxicillin/clavulanic acid |
| AMP | Ampicillin |
| CTX | Cefotaxime |
| CAZ | Ceftazidime |
| CRO | Ceftriaxone |
| CXM | Cefuroxime |
| CIP | Ciprofloxacin |
| GEN | Gentamicin |
| IMP | Imipenem |
| MEM | Meropenem |
| OFX | Ofloxacin |
| PIP | Piperacillin |
| TZP | Piperacillin/tazobactam |
| TOB | Tobramycin |
| 3GC | 3rd Generation Cephalosporins (CTX, CRO, CAZ) |

EARSS *K. pneumoniae*:

Objective and case definition

Objective:

To determine the proportions of *K. pneumoniae* isolates from blood or CSF that are resistant to aminopenicillins (e.g. ampicillin), 3GCs (e.g. cefotaxime, ceftriaxone or ceftazidime), fluoroquinolones (e.g. ciprofloxacin or ofloxacin) and aminoglycosides (e.g. gentamicin)

Case definition:

EARSS collects data on the first invasive isolate of *K. pneumoniae* per patient per quarter

Caveats in interpreting EARSS data

- Care must be exercised when interpreting the raw figures, i.e. increases in numbers of isolates, as the numbers of laboratories reporting to EARSS has increased over the years
- EARSS data does not distinguish clinically significant isolates from contaminants

Annual proportions of AMR *K. pneumoniae* invasive infection with 95% Confidence Intervals (CI)

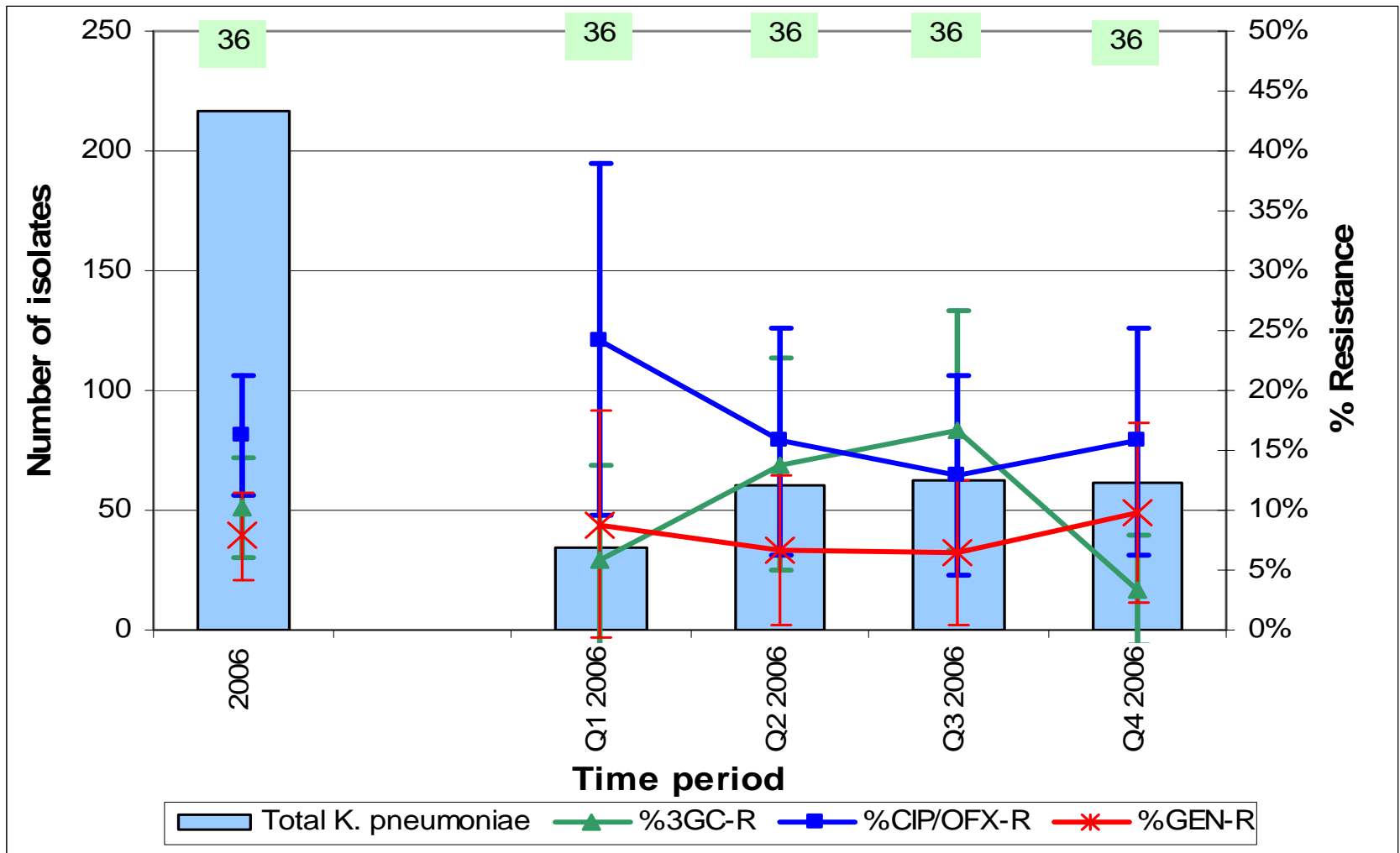
| Year | No. labs | No. isolates | %3GC-R* | 95%CI | %FQ-R* | 95%CI | %GEN-R* | 95%CI |
|---------|----------|--------------|---------|-----------|--------|------------|---------|-----------|
| Q1 2006 | 36 | 34 | 5.9% | 0-13.8% | 24.2% | 9.6-38.9% | 8.8% | 0-18.4% |
| Q2 2006 | 36 | 60 | 13.8% | 4.9-22.7% | 15.8% | 6.3-25.3% | 6.7% | 0.4-13.0% |
| Q3 2006 | 36 | 62 | 16.7% | 6.7-26.6% | 12.9% | 4.6-21.2% | 6.5% | 0.3-12.6% |
| Q4 2006 | 36 | 61 | 3.3% | 0-7.9% | 15.8% | 6.3-25.3% | 9.8% | 2.4-17.3% |
| 2006 | 36 | 217 | 10.2% | 6.1-14.3% | 16.3% | 11.3-21.3% | 7.8% | 4.3-11.4% |

AMR, antimicrobial resistant

FQ-R, Fluoroquinolone (CIP/OFX)-resistant

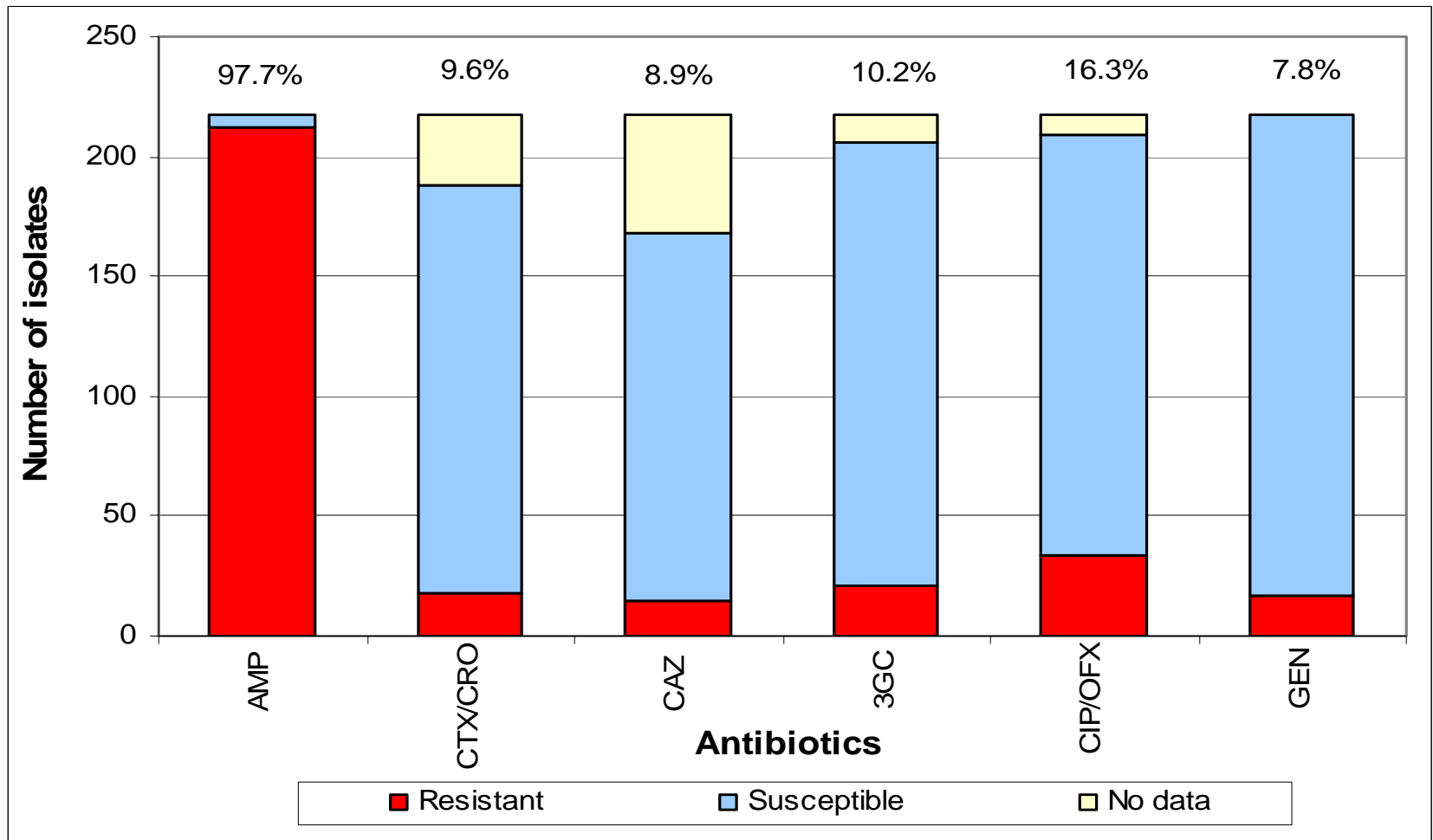
* Not all isolates tested

EARSS in Ireland – *K. pneumoniae* trends



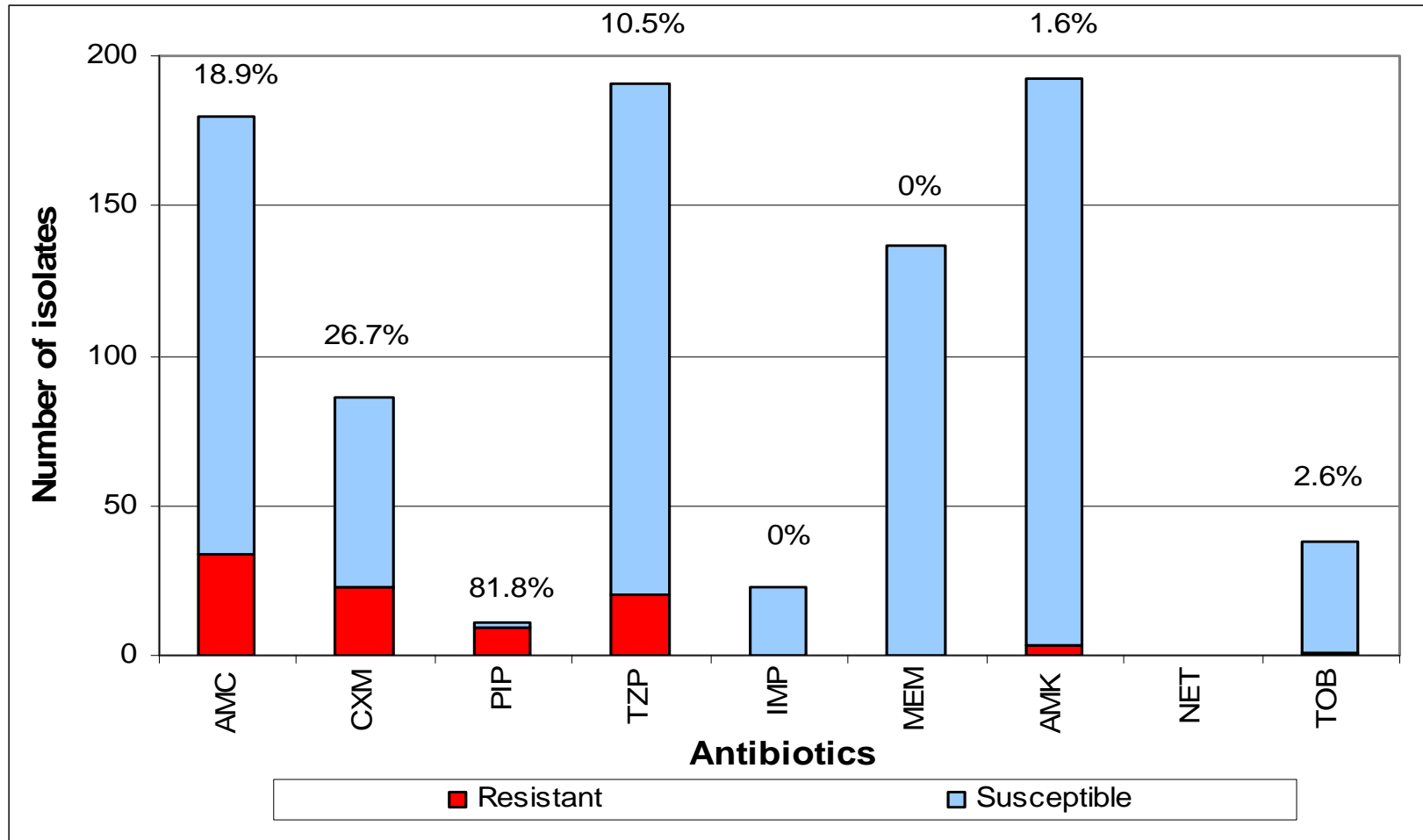
Changes in the numbers of participating laboratories are indicated above the bars

Susceptibility data to mandatory antibiotics for *K. pneumoniae* reported in 2006



Percentage resistance is indicated above the bar

Susceptibility data to other optional antibiotics for *K. pneumoniae* reported in 2006



Percentage resistance is indicated above the bar

Resistance profiles of *K. pneumoniae* isolates in 2006 (n = 217)

| Resistance profile | No. isolates | |
|--------------------|--------------|-----|
| Fully S | 4 | |
| A | 150 | |
| 3 | 1 | |
| A3 | 8 | |
| AC | 9 | |
| AG | 3 | |
| A3C | 9 | MDR |
| ACG | 11 | MDR |
| A3CG | 3 | MDR |
| Incomplete | 19 | |
| Total | 217 | |

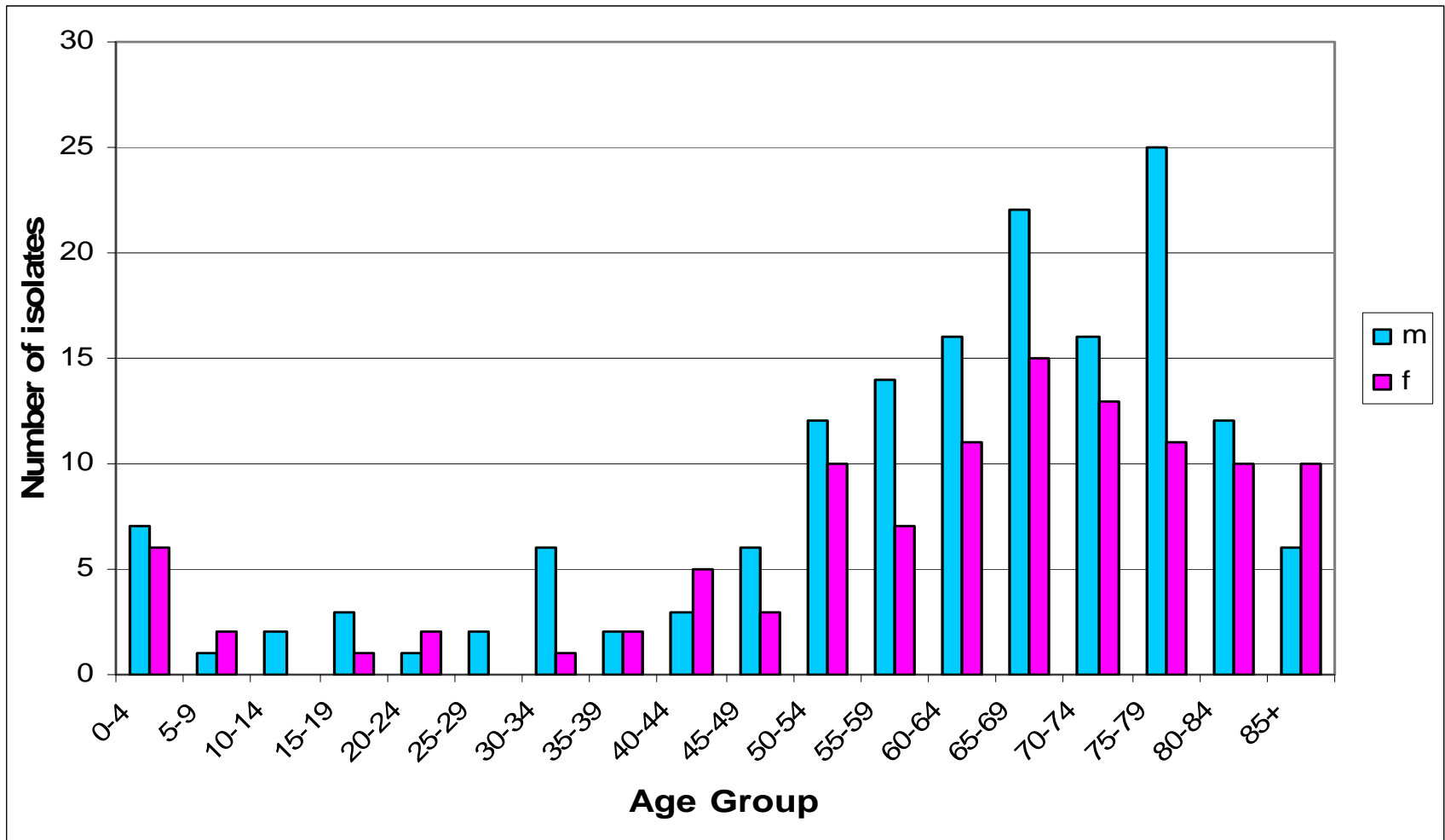
MDR *K. pneumoniae* isolates

| Time period | Total KPN | No. tested against all 4 indicator antibiotics | No. MDR | % MDR |
|-------------|------------|--|-----------|--------------|
| Q1 2006 | 34 | 33 | 5 | 15.2% |
| Q2 2006 | 60 | 55 | 7 | 12.7% |
| Q3 2006 | 62 | 54 | 5 | 9.3% |
| Q4 2006 | 61 | 56 | 6 | 10.7% |
| 2006 | 217 | 198 | 23 | 11.6% |

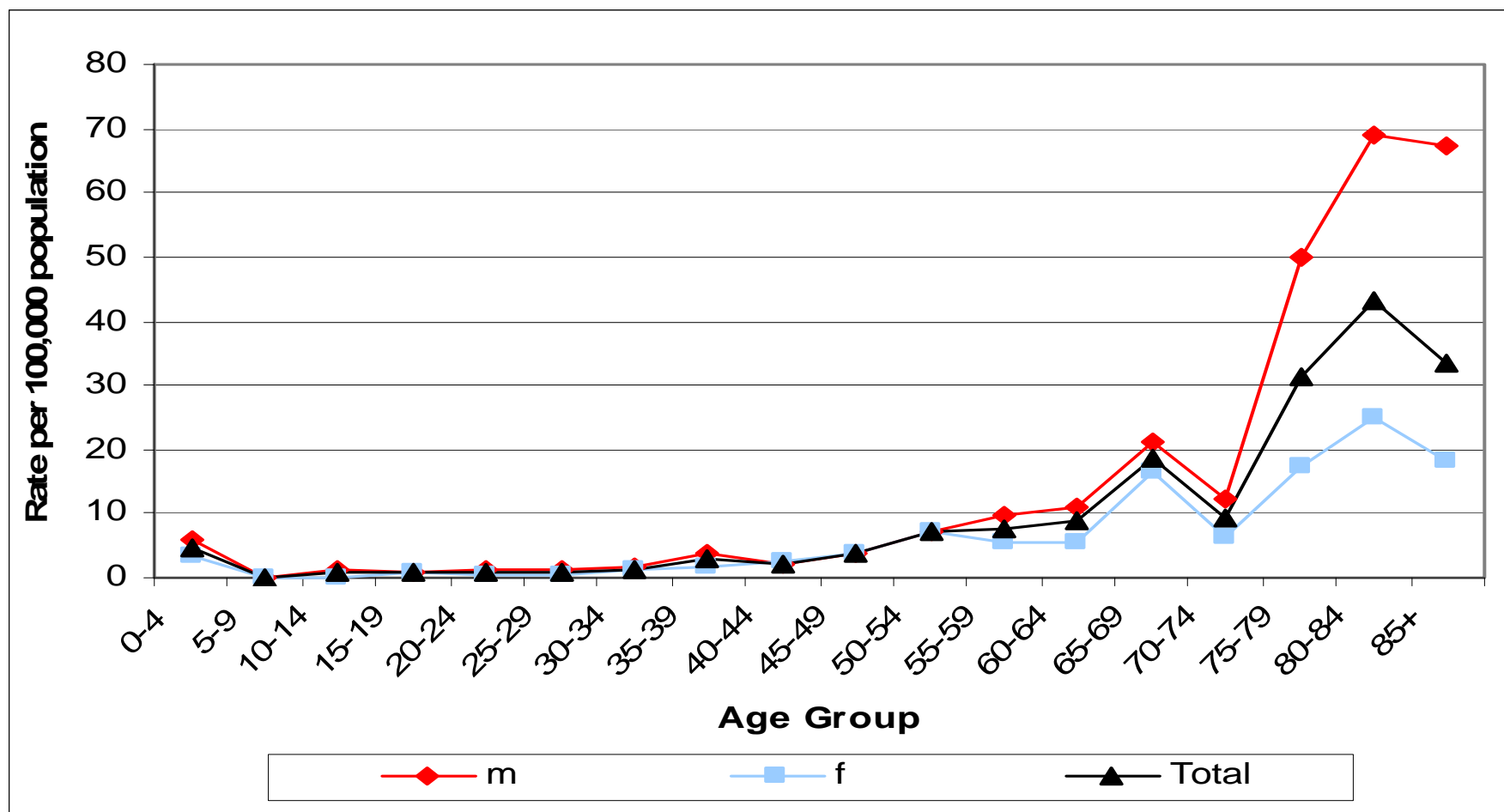
Extended-spectrum Beta-Lactamases (ESBLs)

| Time period | Total KPN | No. ESBL reported | No. ESBL-positive | % ESBL-positive |
|--------------------|------------------|--------------------------|--------------------------|------------------------|
| Q1 2006 | 34 | 22 | 0 | 0.0% |
| Q2 2006 | 60 | 32 | 5 | 15.6% |
| Q3 2006 | 62 | 28 | 5 | 17.9% |
| Q4 2006 | 61 | 44 | 1 | 2.3% |
| 2006 | 217 | 126 | 11 | 8.7% |

Age and sex distribution of patients with invasive *K. pneumoniae* infection in Ireland in 2006



Age and sex-specific incidence rates of invasive *K. pneumoniae* infection in Ireland in 2006



Using the 2006 census as the denominator

(NB. the estimated coverage of the Irish population by EARSS is approx. 98%)

Mean, median, mode and range of ages of patients with invasive *K. pneumoniae* infection in Ireland in 2006

| | No. | No. with age | mean | median (95%CI) | mode | range |
|----------------------|-----|--------------|------|----------------|------|----------|
| <i>K. pneumoniae</i> | 217 | 217 | 60y | 65y (62-68y) | 0y | 3d - 96y |

Sex distribution of patients with invasive *K. pneumoniae* infection in Ireland in 2006

No. male = 132

No. female = 83

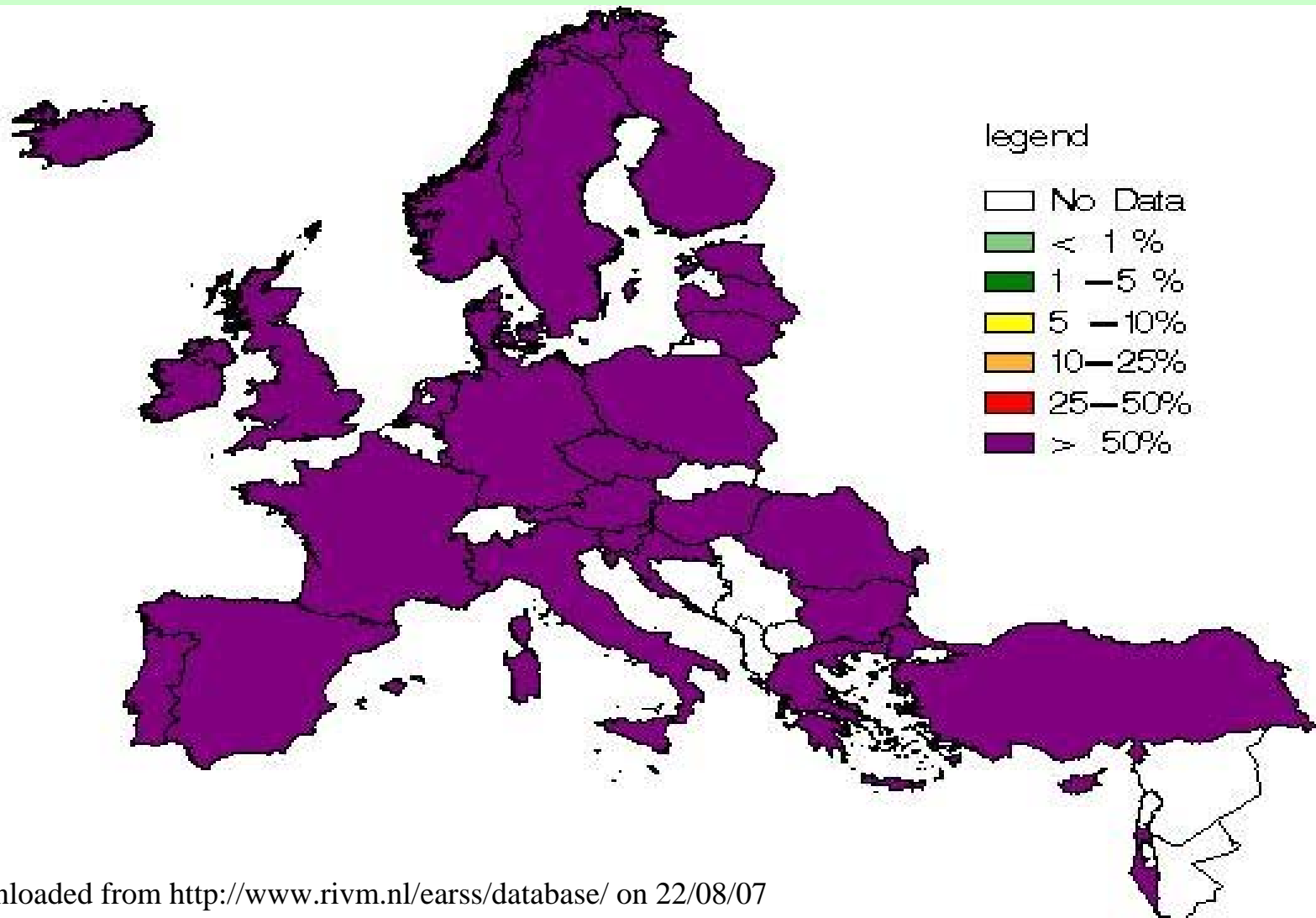
(Gender unknown = 2)

Male-to-female ratio = 1.59:1

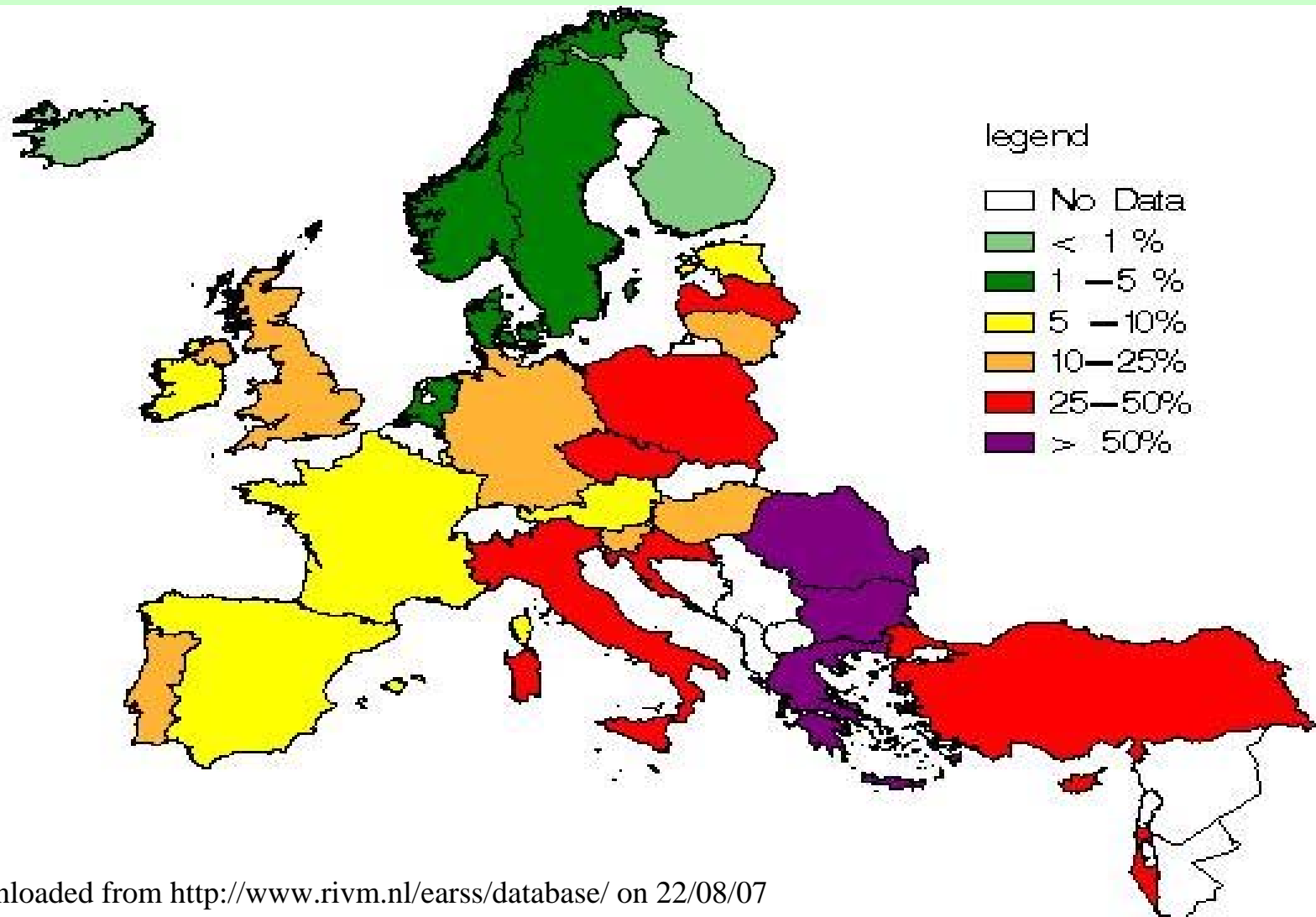
(z-test = 3.432, P-value = <0.001)

Males were approximately 1.6-times more likely to get an invasive *K. pneumoniae* infection than females, which was significant

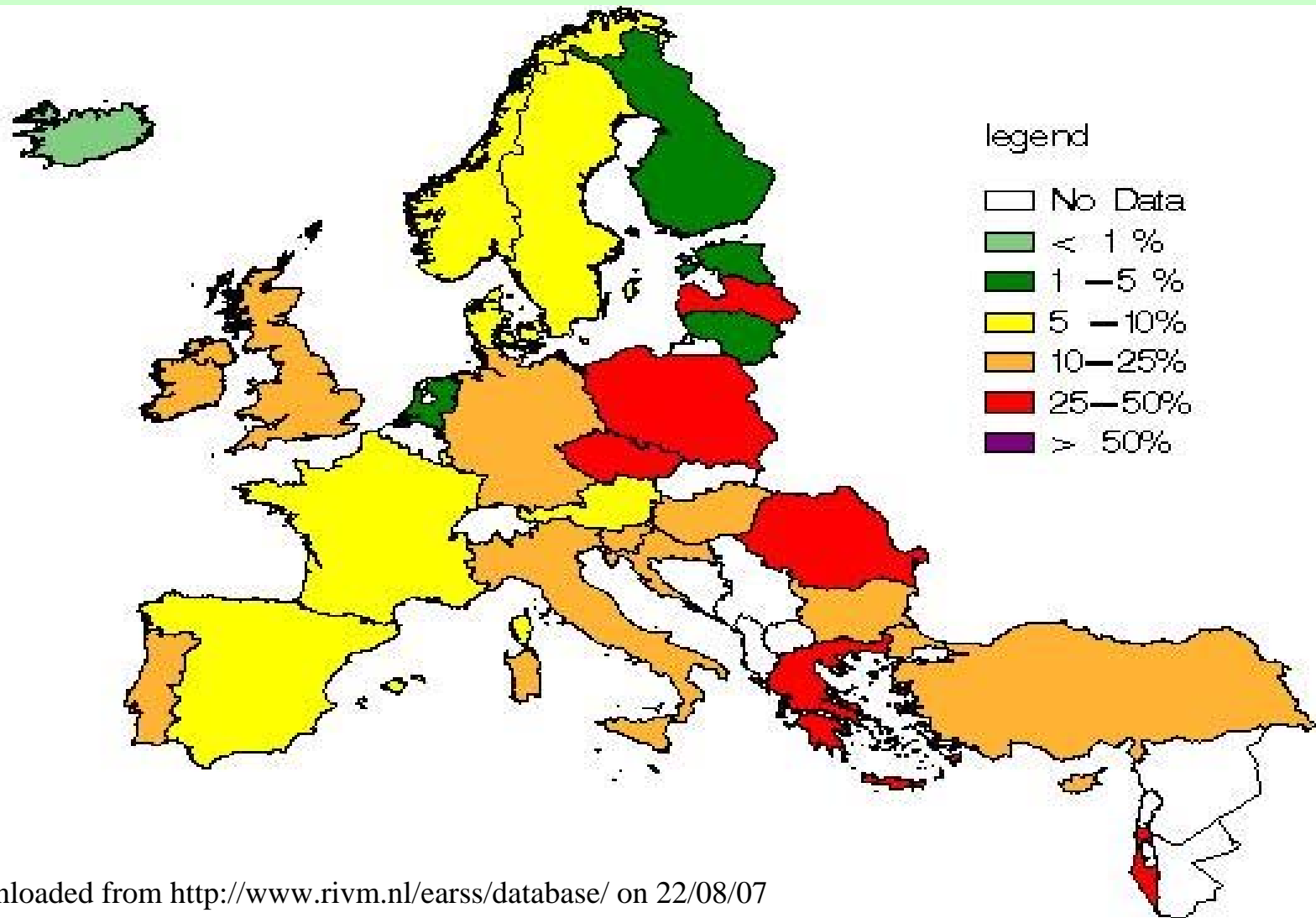
***K. pneumoniae* - distribution of ampicillin resistance in EARSS countries in 2006**



***K. pneumoniae* - distribution of 3GC (CTX, CRO or CAZ) resistance in EARSS countries in 2006**



K. pneumoniae - distribution of fluoroquinolone (CIP/OFX) resistance in EARSS countries in 2006



K. pneumoniae - distribution of aminoglycoside (GEN) resistance in EARSS countries in 2006

