



Feidhmeannacht na Seirbhíse Sláinte
Health Service Executive

EARSS in Ireland, 2007

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

Antibiotic codes and abbreviations:

AMK, Amikacin

AMP, Ampicillin

CTX, Cefotaxime

CPD, Cefpodoxime

CAZ, Ceftazidime

CRO, Ceftriaxone

CIP, Ciprofloxacin

GEN, Gentamicin

IPM, Imipenem

MEM, Meropenem

OFX, Ofloxacin

TZP, Piperacillin-Tazobactam

TOB, Tobramycin

3GC, 3rd-Generation Cephalosporin

AMR, Antimicrobial Resistance

KPN, *Klebsiella pneumoniae*

ESBL, Extended-Spectrum Beta-Lactamase

MDR, Multi-Drug Resistance

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, ceftazidime or cefpodoxime), fluoroquinolones (e.g. ciprofloxacin or ofloxacin), aminoglycosides (e.g. gentamicin) and carbapenems (e.g. meropenem)

Case definition:

- EARSS collects data on the first invasive isolate (from blood or CSF) 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 in invasive *K. pneumoniae*, 2006-2007

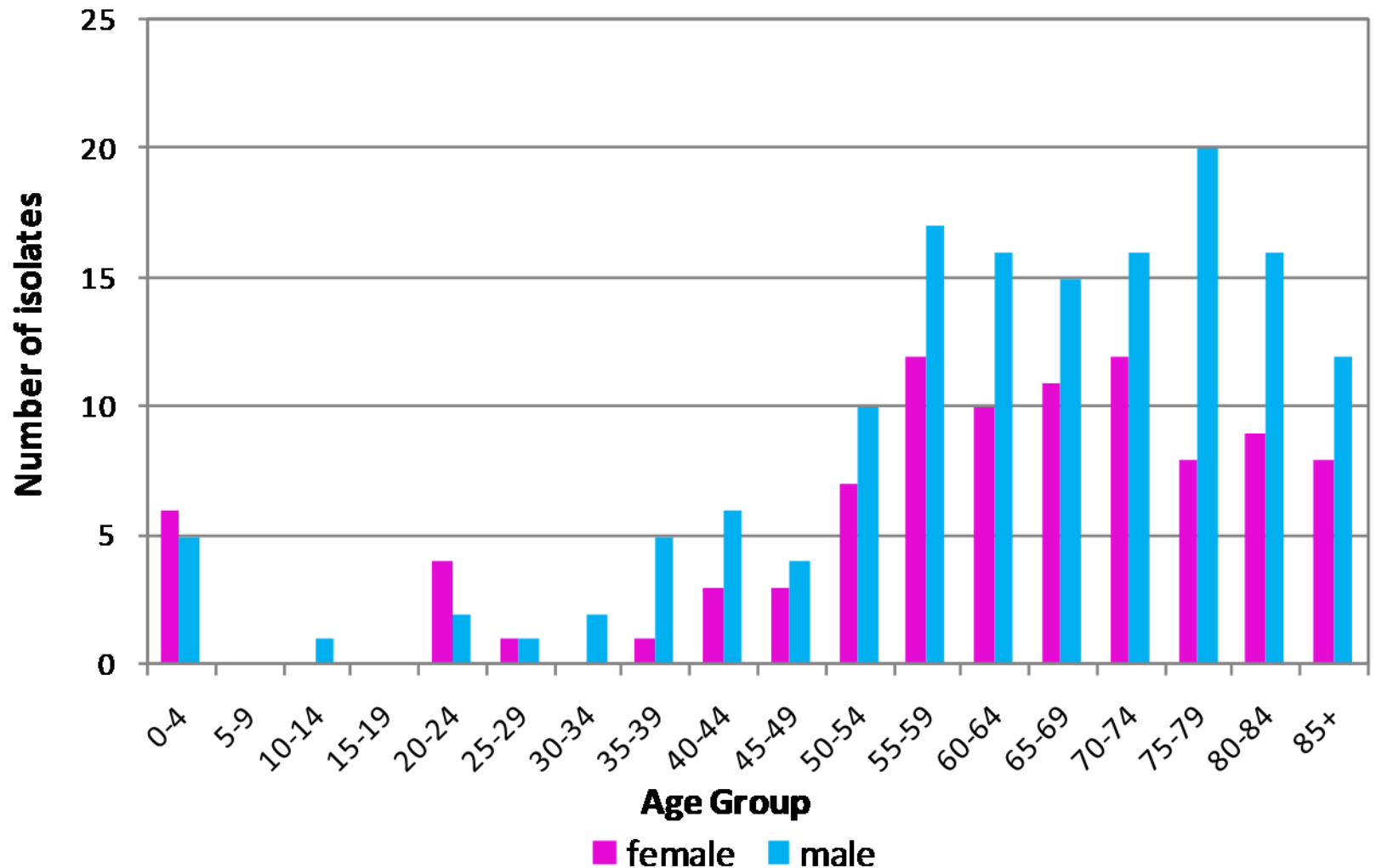
Year	2006	2007
Number of labs	39	41
Number of isolates	217	244
%AMP-R*	97.7	99.2
%3GC-R*	10.2	9.9
%CIP/OFX-R*	15.3	18.1
%GEN-R*	7.8	9.9
%IPM/MEM-R*	0.0	0.6
%ESBL-positive	8.6	3.7
%MDR**	11.2	11.9

* Not all isolates tested

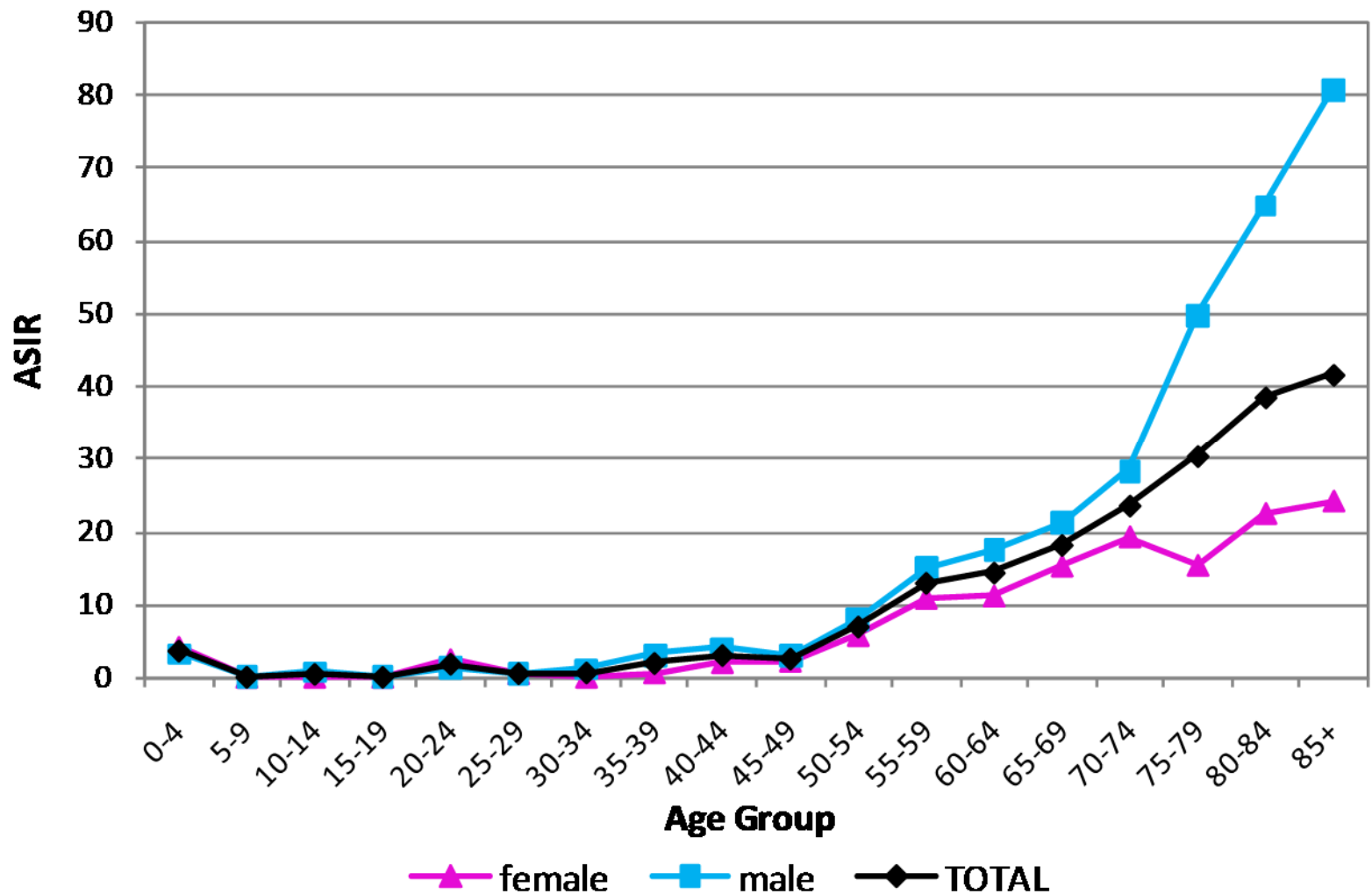
** MDR, defined as resistance to 3 or more of the mandatory antibiotics

Ampicillin susceptibility suggests either an error in the identification of the organism or the susceptibility result as *K. pneumoniae* is inherently resistant to this antibiotic; Resistance to imipenem/meropenem in *K. pneumoniae* warrants further investigation at a reference laboratory

Age and sex distribution of patients with invasive *K. pneumoniae* infection in 2007



Age and sex-specific incidence rates of invasive *K. pneumoniae* infection in 2007



ASIR, Age-Specific Incidence Rate (per 100,000 population)

Mean, median, mode and range of ages of patients with invasive *K. pneumoniae* infection in 2007

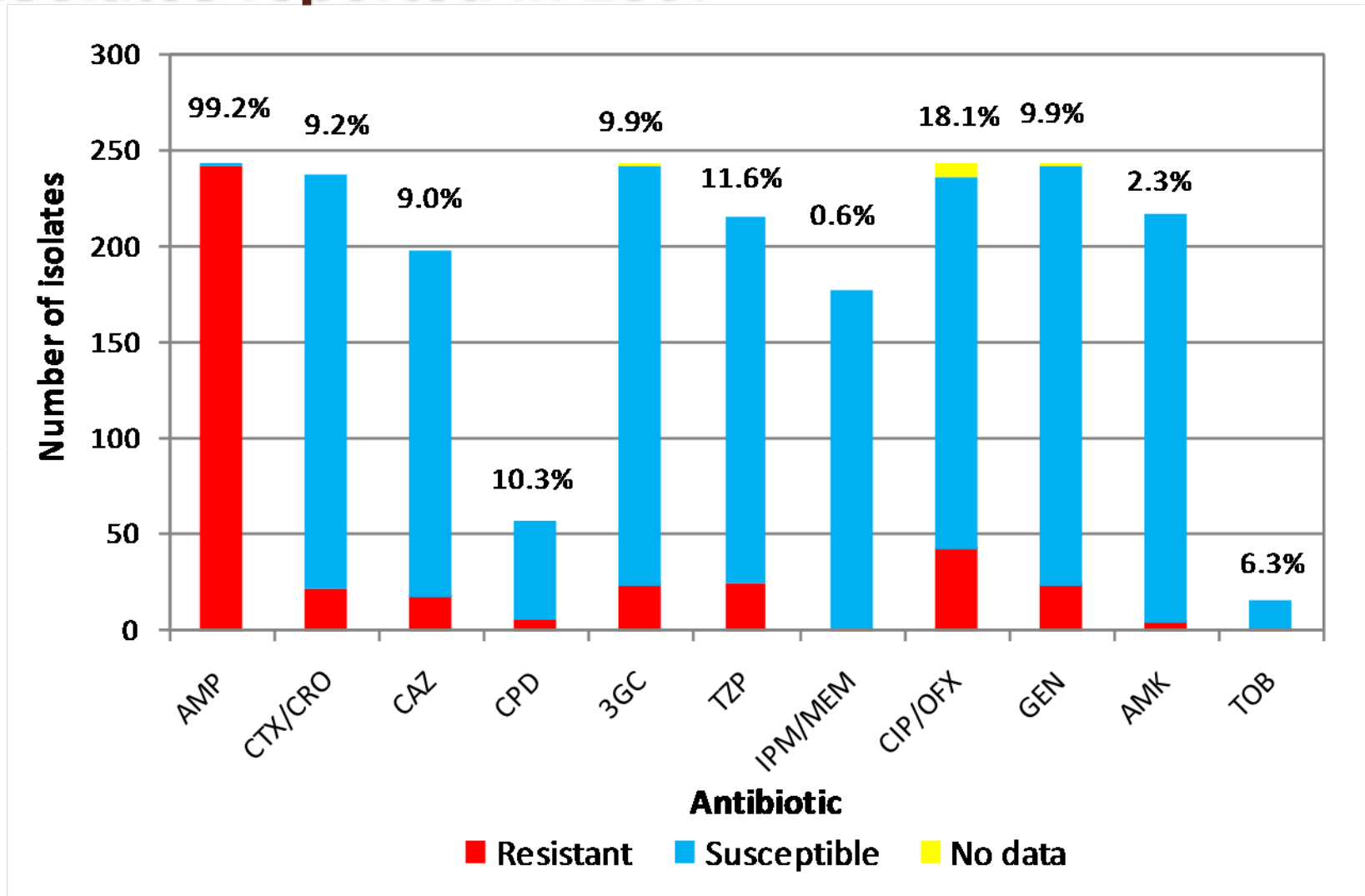
	KPN
n	244
n with age	243
Mean	62.0y
Median	67y (62-69y)
Mode	57y
Range	0-91y

Sex distribution of patients with invasive *K. pneumoniae* infection in 2007

	KPN
No. male	148
%male	60.9
No. female	95
%female	39.1
m/f ratio	1.56:1
z-test	3.48
P-value	0.0005

In patients with laboratory-confirmed invasive *K. pneumoniae* infection in 2007, males were approximately 1.6-times more likely to get an infection than females (highly significant, $P=0.0005$).

Susceptibility data for invasive *K. pneumoniae* isolates reported in 2007



Resistance profiles of *K. pneumoniae* isolates in 2007

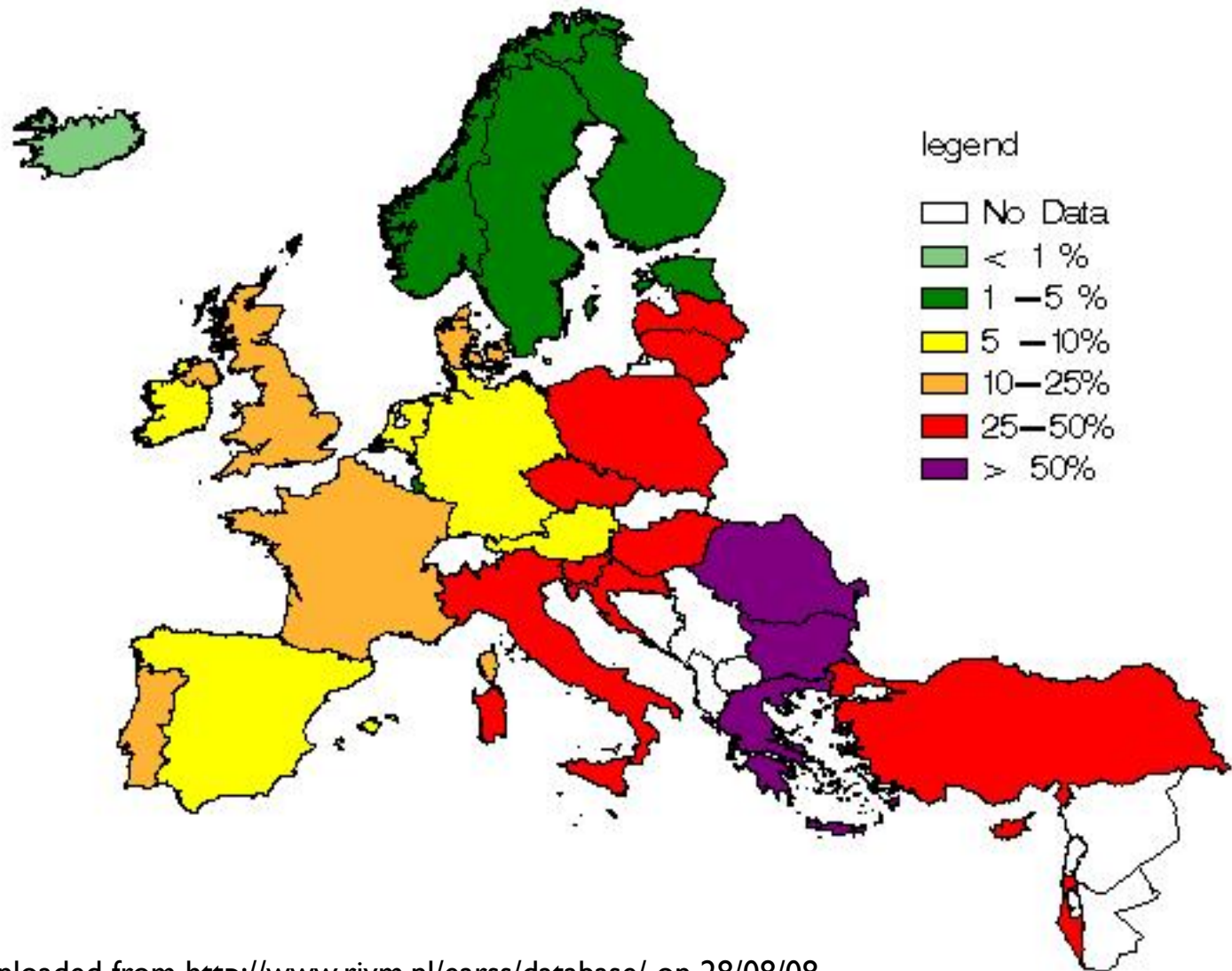
Resistance Profile	Number of isolates	ESBL +ve	ESBL -ve
Fully susceptible*	2		2
A	180		160
A3	5	1	3
AC	14		13
AG	5		3
A3C**	8		7
A3G**	1		1
ACG**	11		9
A3CG**	9	6	1
Not tested against all	9	1	7
Total	244	8	206

A, Ampicillin; 3, 3GC; C, Ciprofloxacin; G, Gentamicin

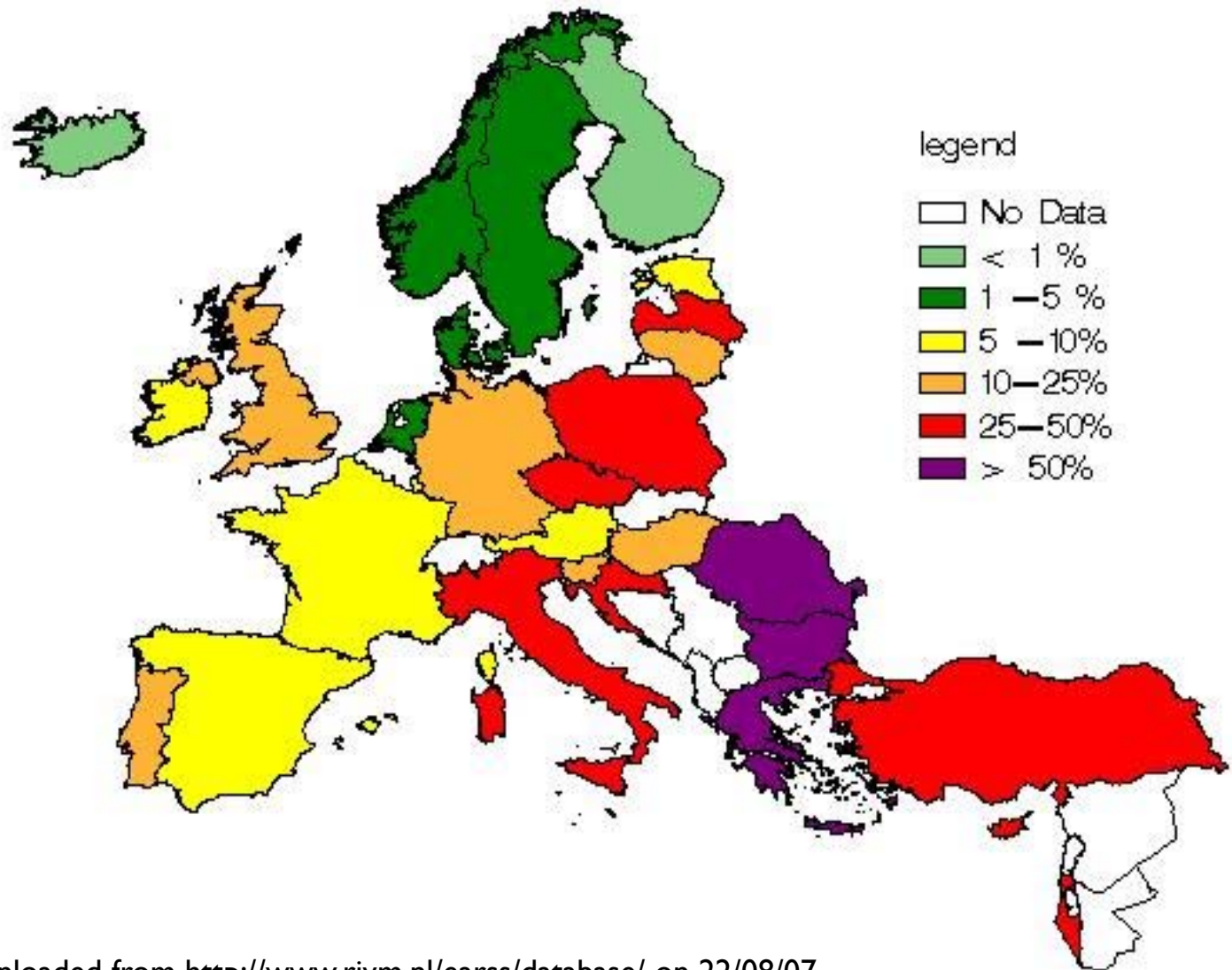
?Identification or susceptibility result: AMP-S KPN unusual phenotype

* MDR, defined as resistance to 3 or more antibiotic classes

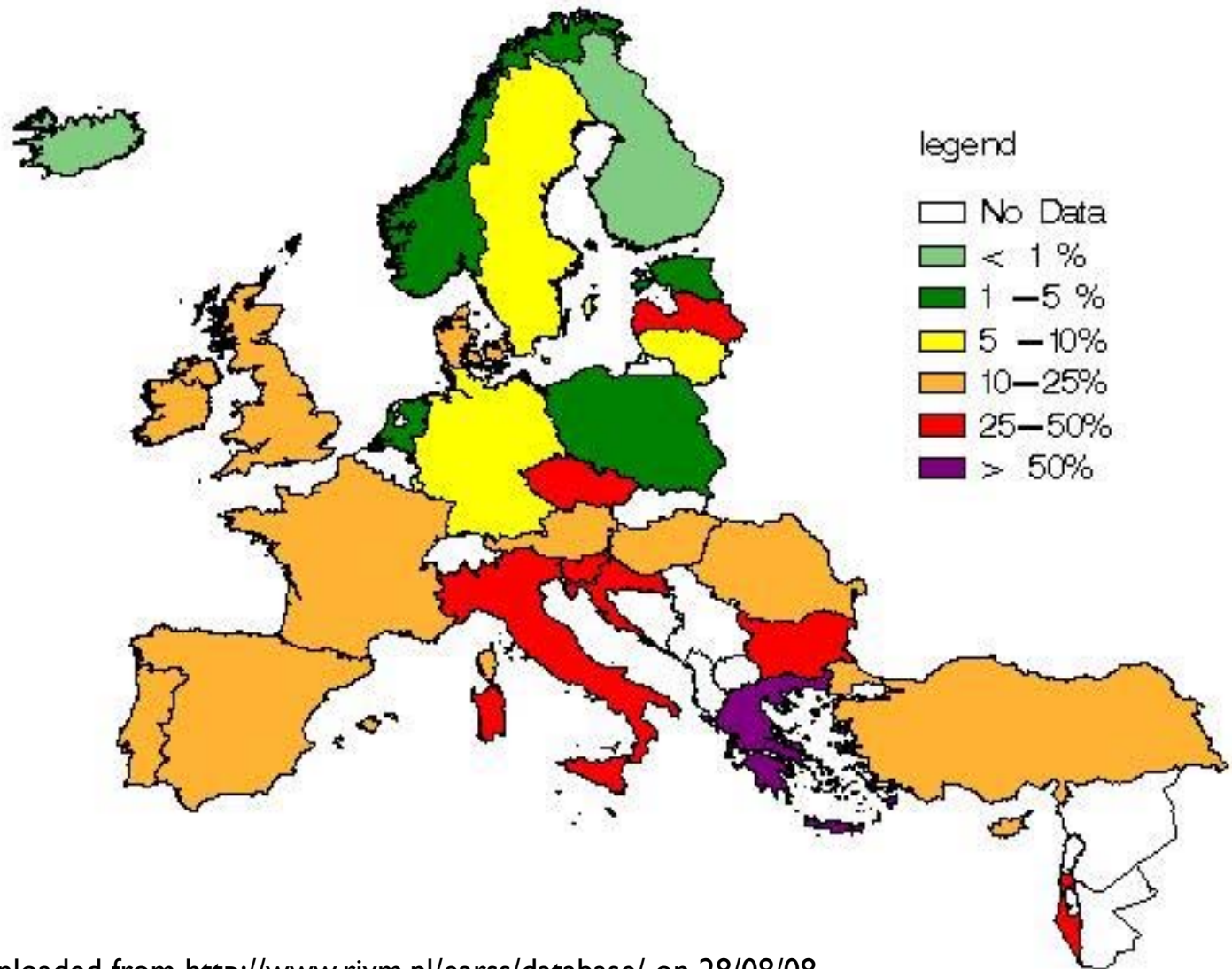
***K. pneumoniae* - distribution of 3GC (e.g. CTX or CAZ) resistance in EARSS countries in 2007**



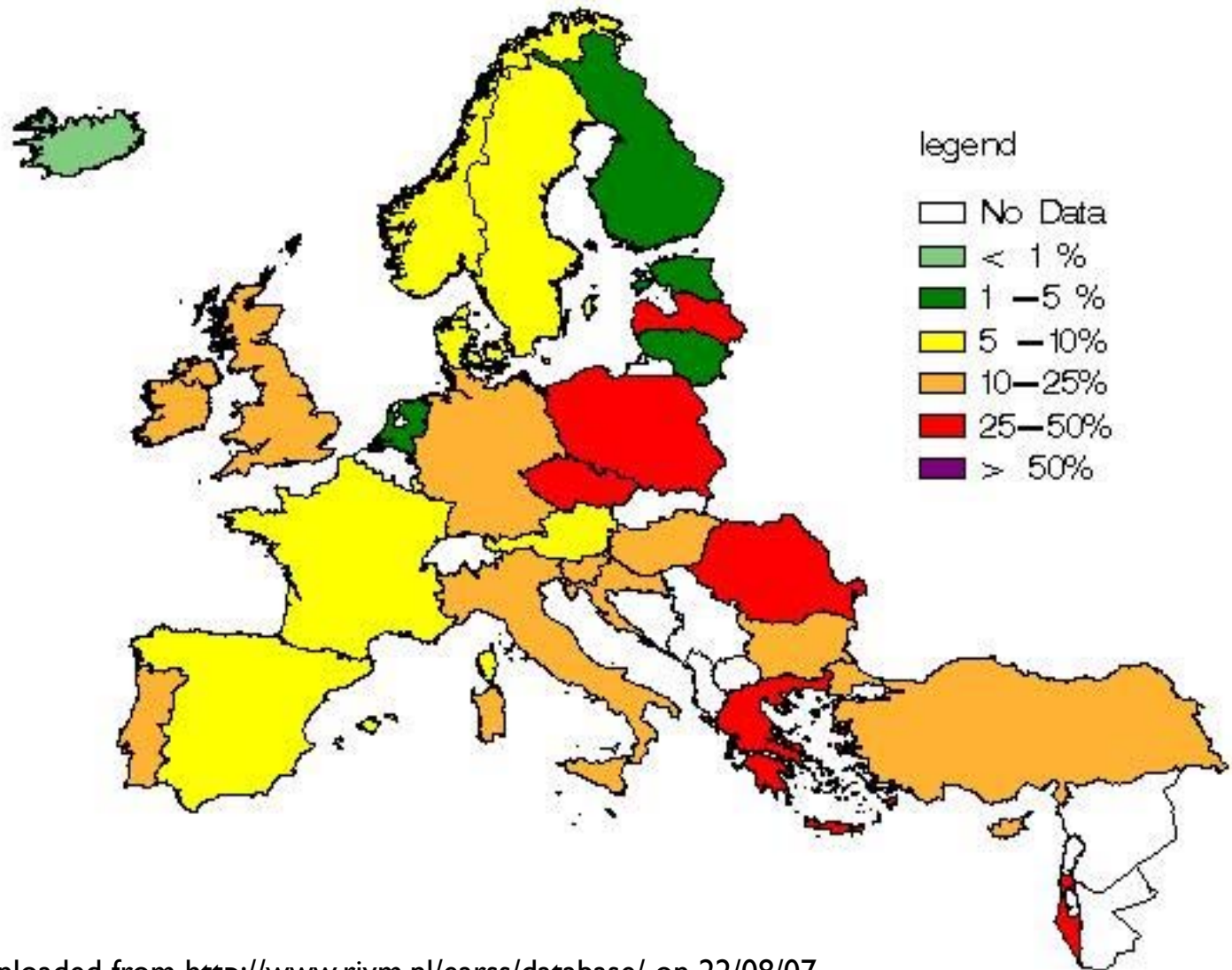
***K. pneumoniae* - distribution of 3GC (e.g. CTX or CAZ) resistance in EARSS countries in 2006**



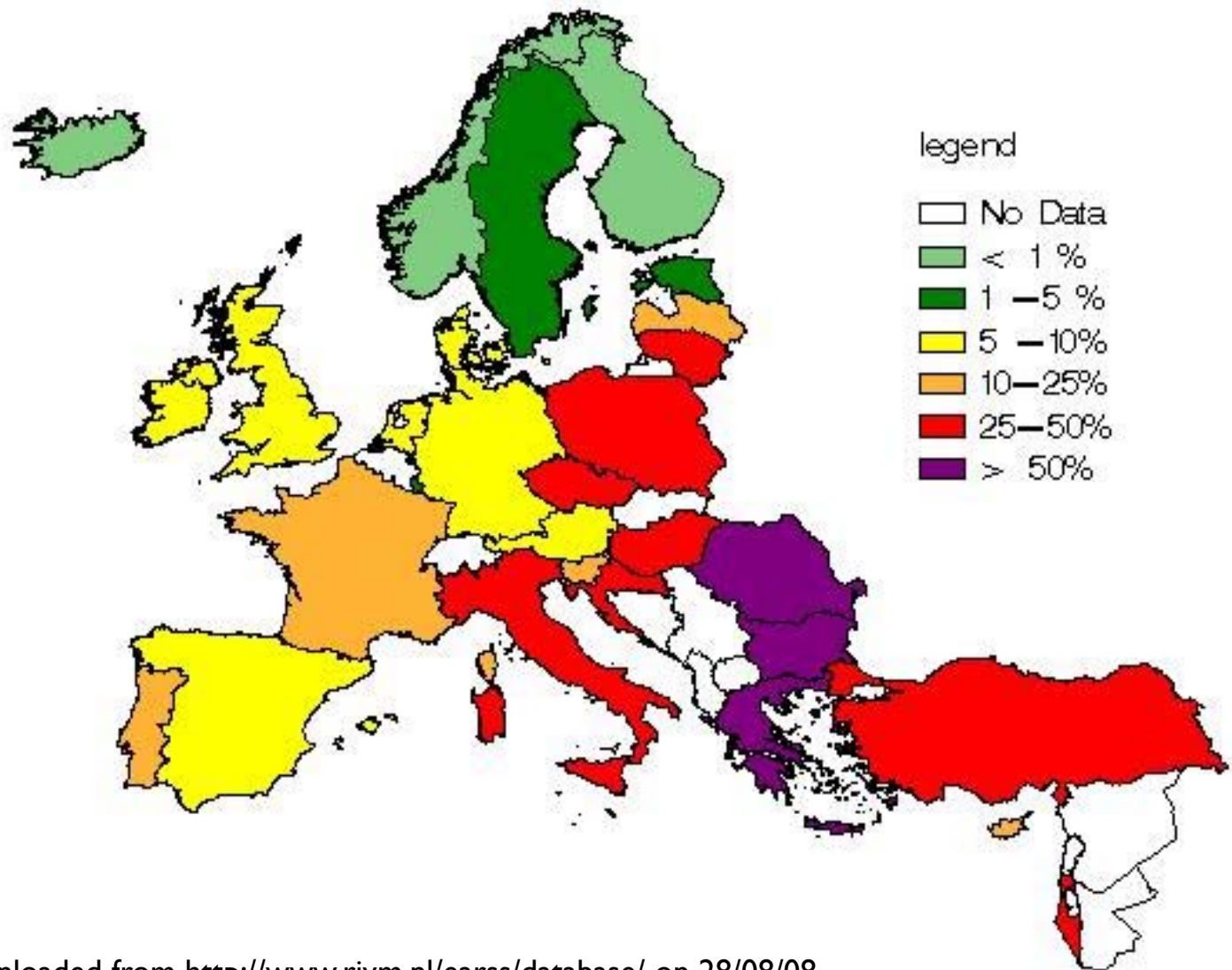
Map downloaded from <http://www.rivm.nl/earss/database/> on 28/08/08



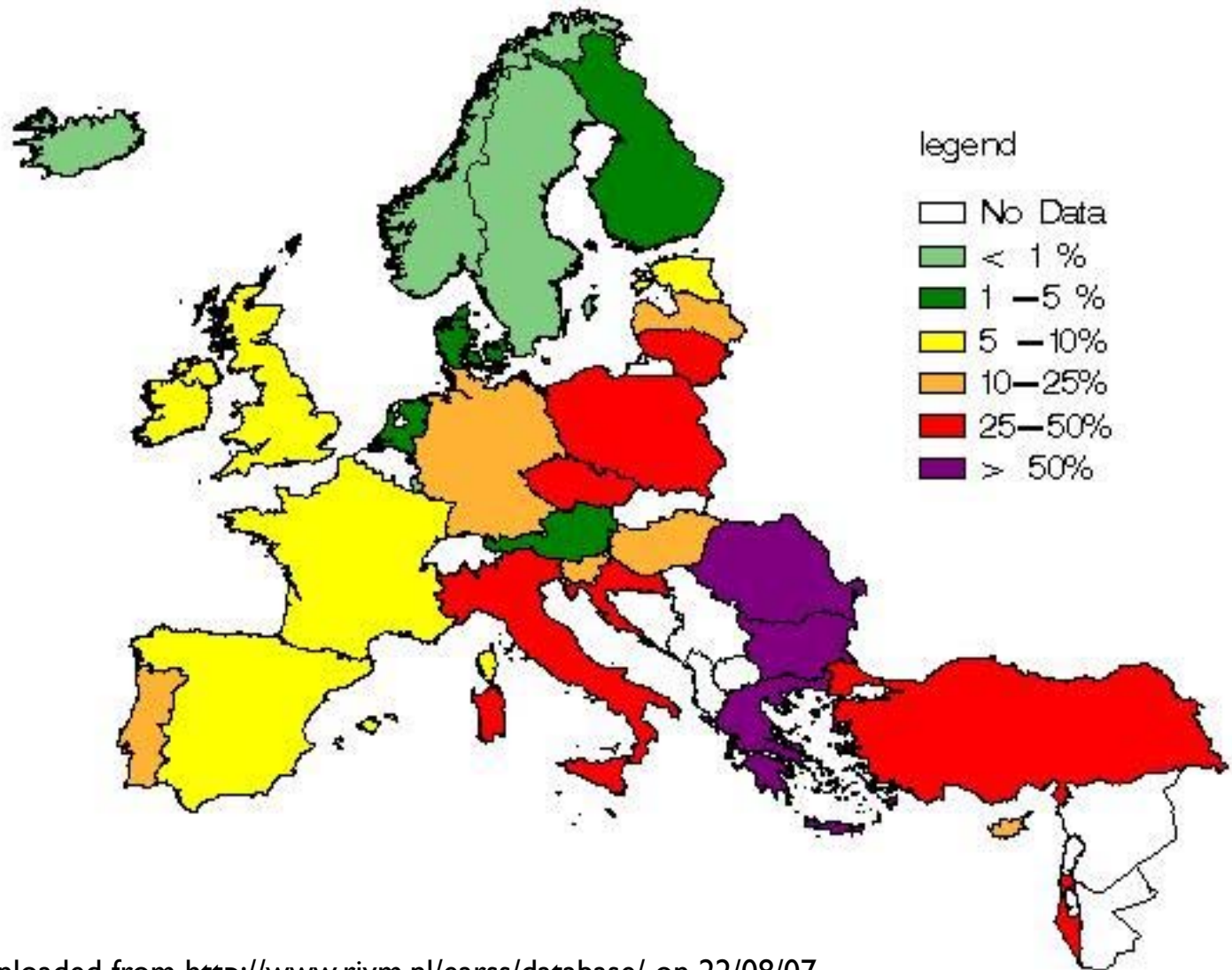
***K. pneumoniae* - distribution of fluoroquinolone (e.g. CIP) resistance in EARSS countries in 2006**



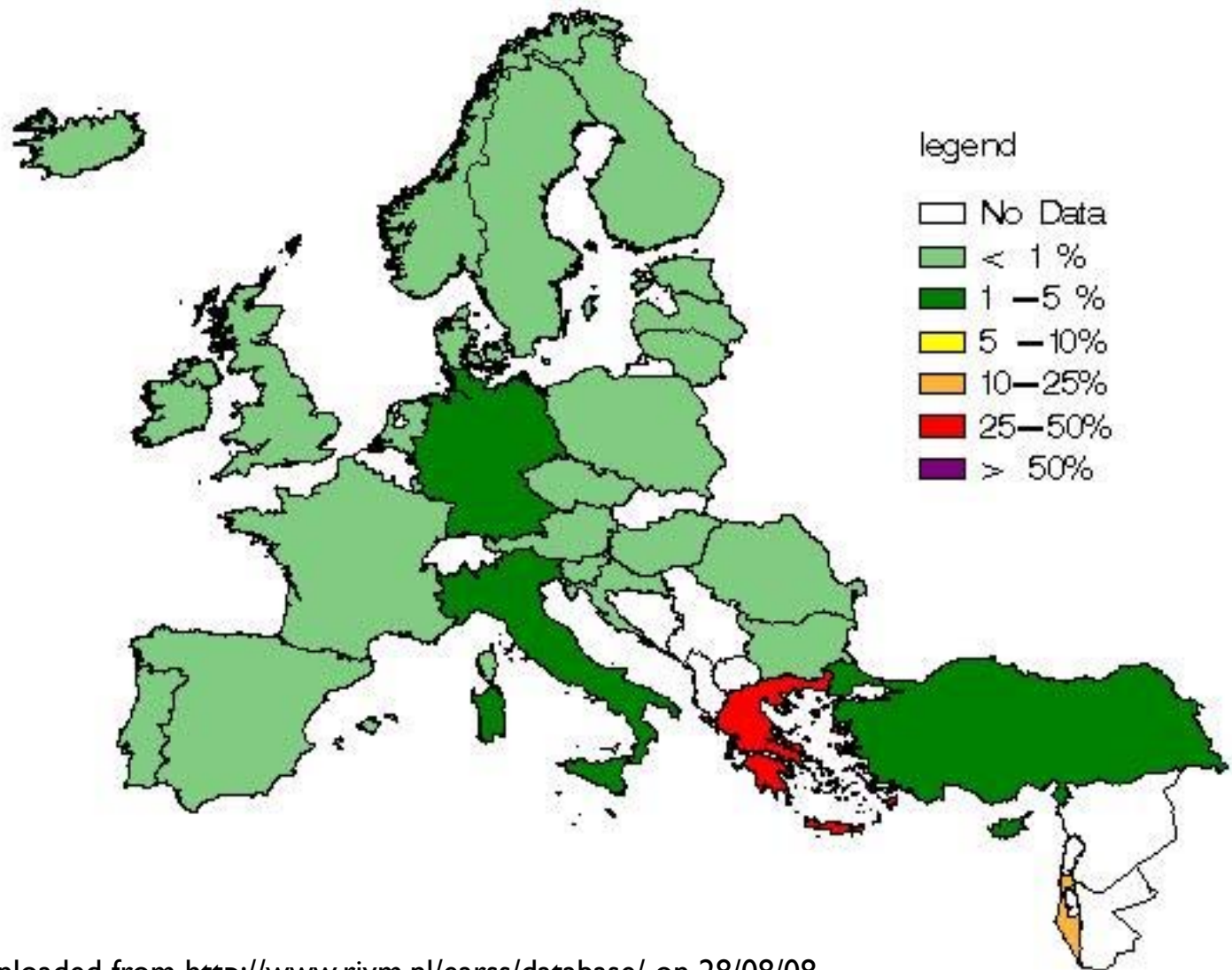
***K. pneumoniae* - distribution of aminoglycoside (e.g. GEN) resistance in EARSS countries in 2007**



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



***K. pneumoniae* - distribution of carbapenem (e.g. MEM) resistance in EARSS countries in 2007**



***K. pneumoniae* - distribution of carbapenem (e.g. MEM) resistance in EARSS countries in 2006**

