



## in Germany 2009-2011: are there any trends?

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### Objectives

The European Antimicrobial Resistance Surveillance Network (EARS-Net) Report 2011 reveals increasing trends of combined resistance to third-generation cephalosporins (3GC), fluoroquinolones (FQ) and aminoglycosides (AG) in invasive *K. pneumoniae* isolates from hospitalised patients over the past four years for many European countries but not for Germany. The German Antimicrobial Resistance Surveillance (ARS) System collects data for isolates from all specimen types thus allowing to study trends in isolates from urine and respiratory samples as well.

### Materials & Methods

Analysis is based on isolates of *K. pneumoniae* collected by eight laboratories covering 191 hospitals with continuous data submission for the period 2009 to 2011. Copy strain elimination is based on first isolate/patient/year for analysis of all specimen and first isolate/patient/specimen type/year for specimen specific analysis. Species identification and antimicrobial susceptibility testing is performed by VITEK 2.

Isolates are classified as non-susceptible to an antibiotic class if they show non-susceptibility to one of its agents:

- 3GC: ceftazidime or cefotaxime or ceftriaxone
- FQ: ciprofloxacin or levofloxacin
- AG: gentamicin or tobramycin or amikacin.

Significance of differences of proportions is evaluated on the basis of 95%-confidence intervals.

### Results

antibiotic class	year	specimen type							
		all specimen		blood cultures		urines		respiratory	
		R+I%	95%CI	R+I%	95%CI	R+I%	95%CI	R+I%	95%CI
Aminoglycosides	2009	11,0	10.3 - 11.7	13,0	9.7 - 16.3	12,0	11.0 - 13.0	11,0	8.8 - 13.2
	2010	10,9	10.3 - 11.6	14,2	10.9 - 17.5	11,3	10.4 - 12.2	14,7	12.3 - 17.0
	2011	10,7	10.0 - 11.3	11,6	8.6 - 14.6	10,6	9.7 - 11.4	12,5	10.4 - 14.7
Cephalosporines	2009	13,1	12.3 - 13.8	12,8	9.5 - 16.1	13,7	12.7 - 14.7	13,2	10.8 - 15.6
	2010	13,1	12.4 - 13.8	14,0	10.7 - 17.3	13,4	12.5 - 14.4	16,2	13.7 - 18.6
	2011	13,5	12.8 - 14.2	11,6	8.6 - 14.6	13,1	12.2 - 14.0	14,5	12.2 - 16.9
Fluorchinolones	2009	15,2	14.4 - 16.0	17,5	13.8 - 21.3	16,7	15.6 - 17.8	14,7	12.2 - 17.2
	2010	15,3	14.6 - 16.1	16,6	13.0 - 20.1	16,4	15.4 - 17.4	17,9	15.4 - 20.5
	2011	16,5	15.7 - 17.2	16,0	12.5 - 19.4	16,9	15.9 - 17.9	16,4	14.0 - 18.9
combined non-susceptibility	2009	7,9	7.3 - 8.6	10,8	7.7 - 13.8	8,3	7.5 - 9.2	9,0	7.0 - 11.1
	2010	8,2	7.7 - 8.8	10,7	7.8 - 13.7	8,6	7.8 - 9.4	11,0	8.9 - 13.1
	2011	8,1	7.5 - 8.6	9,6	6.8 - 12.3	8,1	7.4 - 8.9	8,9	7.1 - 10.8
sample sizes:		2009: 7,599		2009: 399		2009: 4,269		2009: 763	
number of isolates tested		2010: 8,802		2010: 429		2010: 5,070		2010: 871	
for all 3 classes by year		2011: 8,693		2011: 438		2011: 5,146		2011: 894	

Table 1: Non-susceptibility in *K. pneumoniae* isolates from hospitalised patients in Germany 2009-2011: proportions of non-susceptibility (R+I%) against fluoroquinolones, third-generation cephalosporines, aminoglycosides and combined non-susceptibility to these antibiotic classes and confidence intervals (95%CI) stratified by year and specimen type: all specimen, blood cultures, respiratory and urine samples.

### Results

Analysis is based on 25,094 non-duplicate *K. pneumoniae* isolates from inpatients (blood cultures: 1,266; respiratory samples: 2,528; urine: 14,485). Results are displayed in table 1. The overall picture shows little variation in the period 2009 to 2011 for all antibiotic classes in all specimen types. Proportions of combined non-susceptibility were highest in blood cultures followed by respiratory samples (9.6% resp. 8.9% in 2011). There were no significant continuous trends over three years for any antibiotic class in any specimen type.

Non-susceptibility to carbapenems (imipenem or meropenem) was below one per cent in all specimen (not displayed in table).

### References

- ARS-Website: <https://ars.rki.de>  
 Antimicrobial resistance surveillance in Europe 2011. Annual report of the European Antimicrobial Resistance Surveillance Network (EARS-Net).

### Conclusion

Proportions of non-susceptibility to the main antibiotic classes for the treatment of *K. pneumoniae* showed little variation over the period 2009 to 2011. This absence of increasing trends in contrast to many European countries is good news for Germany. Proportions of non-susceptibility to carbapenems remained below one per cent despite several outbreaks with carbapenem-resistant *K. pneumoniae* in Germany since 2010.

### Acknowledgements

We like to thank for their contribution to this presentation: Gemeinschaftspraxis für Laboratoriumsmedizin, Plön • Institut für Infektionsmedizin, Universitätsklinikum Schleswig-Holstein, Kiel • Institut für Hygiene und Medizinische Mikrobiologie, Universitätsklinikum Heidelberg • Labor 28, Berlin • Labor Dr. Limbach & Kollegen, Heidelberg • MVZ Dortmund - Dr. Eberhard & Partner, Dortmund • MVZ Dr. Lör - Dr. Treder und Kollegen, Münster • MVZ Dr. Stein und Kollegen, Mönchengladbach