# Carbapenem-non-susceptibility in *Acinetobacter baumannii*: Data from the German Antibiotic Resistance Surveillance System (ARS) from 2008-2011

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## Introduction

The increase of carbapenem-non-susceptibility and associated multiresistance in *Acinetobacter (A.) baumannii* requires consistent surveillance. Data from the German Antibiotic Resistance Surveillance system (ARS) are presented.

## Material and Methods

ARS is a voluntary laboratory based surveillance system collecting resistance data of all clinical pathogens and sample types. Data are transmitted electronically to the central data-base of the national public health institute. The development of single susceptibility-rates and of resistance patterns of *A. baumannii* from 2008 to 2011 is presented. Carbapenem-non-susceptibility was defined as non-susceptibility to imipenem (IMP) and/or meropenem (MER). The panel of antibiotics and antibiotic classes used for the assessment of multiresistance comprised aminopenicillin/sulbactam, ceftazidim, ciprofloxacin, carbapenems (IMP AND MER) and aminoglycosides (gentamycin AND tobramycin). Multiresistance was defined as non-susceptibility to three or more antibiotics/antibiotic classes. For all analyses only data from hospitals participating over the whole time period have been considered. Copy-strains and screening samples have been excluded.

## Results

Carbapenem-non-susceptibility of *A. baumannii* increased from 8.1% in 2008 to 14.0% in 2011 (p=0.004) (Table 1). Stratification according to ward type revealed that the level of the rate was higher on Intensive Care Units (ICU), but the rise of carbapenem-non-susceptibility was primarily seen on general wards (6.5% to 13.2%, p=0.002). Differentiation by hospital type showed that tertiary care hospitals exhibited the highest carbapenem-non-susceptibility-rates and an increase from 10.7% in 2008 to 18.8% in 2011 (p=0.05). Considering pooled data from 2008 to 2011, respiratory samples revealed the highest rates of carbapenem-non-susceptibility (27.3%) as compared to other sample types (Figure 1). While the percentage of multiresistant isolates with non-susceptibility to three or more antibiotic classes showed no significant change (15.9% to 14.1%, p=0.54), isolates with simultaneous non-susceptibility to all five antibiotics/antibiotic classes increased significantly from 1.9% to 4.9% (p=0.01).

**Table 1. Carbapenem-non-susceptibility* of *A. baumannii* in hospital care, stratified by ward and hospital type**

| *Acinetobacter baumannii* | 2008 | | 2009 | | 2010 | | 2011 | |
|---|---|---|---|---|---|---|---|---|
| | n | %R/I | n | %R/I | n | %R/I | n | %R/I |
| Hospital care, total | 695 | 8.1 | 622 | 5.1 | 662 | 13.0 | 486 | 14.0 |
| | | | | | | | | |
| Ward type | | | | | | | | |
| Intensive Care Units | 107 | 16.8 | 92 | 10.9 | 119 | 20.2 | 100 | 16.5 |
| General wards | 588 | 6.5 | 530 | 4.2 | 543 | 11.4 | 386 | 13.2 |
| | | | | | | | | |
| Hospital type | | | | | | | | |
| Tertiary care hospitals | 196 | 10.7 | 197 | 7.6 | 274 | 13.1 | 208 | 18.8 |
| General care hospitals | 384 | 7.0 | 330 | 2.1 | 317 | 11.7 | 235 | 7.7 |
| Single speciality | 105 | 7.6 | 88 | 11.3 | 59 | 20.3 | 41 | n.d.** |

*non-susceptibility to imipenem and/or meropenem **n.d., not done (<50 isolates)

**Figure 1. Carbapenem-non-susceptibility* of *A. baumannii* in hospital care, stratified by sample type**

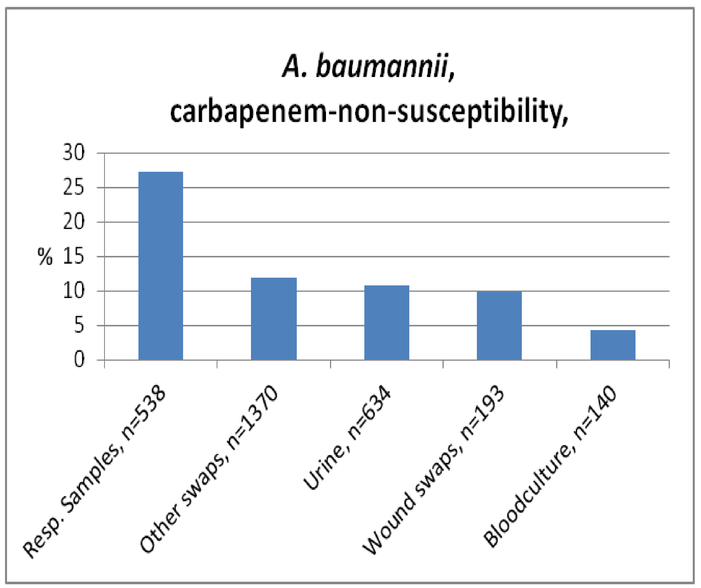
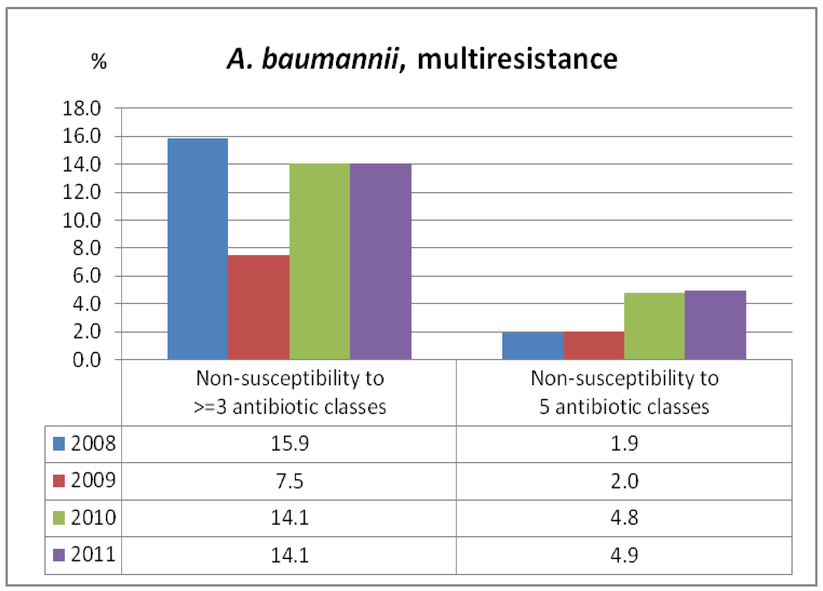



**Figure 2. Development of multiresistance in *A. baumannii*-isolates from 2008 to 2011, hospital care**

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## Conclusions

Carbapenem non-susceptibility of *A. baumannii* increased significantly. This was combined with a rise of the percentage of isolates with non-susceptibility to all five antibiotics/antibiotic classes. Focus of the increase was on general wards and in tertiary care hospitals. Consequent implementation of infection control measures, early and effective action in outbreak situations and the establishment of antbiotic stewardship programms are indispensable for the containment of further spread.

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