

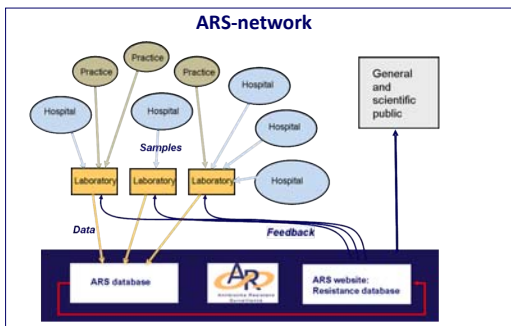
## Introduction

Surveillance is an indispensable component of most strategies for control and prevention of MRSA. In Germany, the Surveillance of Methicillin-resistant *Staphylococcus aureus* (MRSA) is based on several institutions approaching the MRSA-problem by using different methodological strategies. First data from ARS, the German Antibiotic Resistance Surveillance system, and mandatory reporting of MRSA in blood cultures are presented.

## Material and Methods

**ARS:** Within a framework of a voluntary laboratory based surveillance system resistance-data of all clinical pathogens and sample types from hospital and ambulatory care were transmitted electronically to the central data-base of the national public health institute (Robert Koch Institute, RKI). Screening samples have been excluded from analysis.

### ARS-network



**Notifications of MRSA:** Since 1<sup>st</sup> July 2009, all microbiological laboratories are obliged to report the detection of MRSA in blood and cerebrospinal fluid to the local public health authority from where it is reported to the RKI via the state health department. MRSA-incidences have been calculated by using denominators based on the German population 2009. The relationship between regional incidences and MRSA-rates of eight federal states has been assessed by application of spearman rank correlation.

## Results

**ARS:** In 2009, 10 laboratories supplying 226 hospitals and 3222 medical practices provided resistance data from 37076 *Staphylococcus aureus* isolates. MRSA-proportions stratified by hospital and outpatient care are presented in table 1 and 2.

**Table 1: MRSA-rate in outpatient care, 2009**

Outpatient Care	MRSA	<i>S. aureus</i> -isolates*
	%	n
<b>total</b>	12.5	14825
<b>Medical specialities</b>		
Urology	27.1	285
Internal medicine	16.3	5387
Surgery, other	16.4	526
Nephrology	15.3	806
General surgery	12.0	1675
Ear nose throat medicine	6.9	1356
Dermatology	4.1	1557
Gynaecology and Obstetrics	4.3	870
Pädiatrics	3.9	846
other specialities	9.3	439
Unknown	20.5	1078
<b>Sample type**</b>		
Urinary Tract	22.4	1289
Blood	21.4	70
Surgical site	16.1	4880
Respiratory samples	12.9	498
Skin and Soft tissue	10.4	8216
Invasive Punctures	9.6	157
Other	24.7	178

\*Copystrain-rule 1: 1 isolate/patient/year

\*\*Copystrain-rule 2: 1 isolate/sample type/patient/year

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## Results

**Table 2: MRSA-Rates in hospital care, 2009**

Hospital Care	MRSA	<i>S. aureus</i> isolates*
	%	n
<b>Total</b>	21.60	22251
<b>Hospital type</b>		
Tertiary level hospitals	22.8	9444
Other acute care hospitals	21.8	10737
Single speciality hospitals	16.1	1867
Not classified	12.8	203
<b>Intensiv Care Unit, total</b>	24.8	2335
<b>Medical department</b>		
Surgical	31.80	358
Medical	23.40	872
Interdisciplinary	23.70	1105
<b>General ward, total</b>	20.7	19916
<b>Medical specialities</b>		
Geriatrics	44.8	286
Nephrology	35.2	392
Urology	31.8	680
Neurology	30.6	304
Internal medicine	28.4	5867
Vascular surgery	27.3	593
Hämato-/Oncology	26.6	263
Trauma surgery	18.5	669
General surgery	17.4	4270
Orthopäedics	16.2	457
Surgery, other	13.4	529
Ear nose throat medicine	12.2	247
Dermatology	9.8	591
Gynaecology and Obstetrics	6.9	813
Neonatology	5.9	153
Pädiatrics	5.1	1244
Other specialities	20.6	2558
<b>Sample type**</b>		
Urinary tract	33.0	2412
Skin and soft tissue	26.9	7528
Respiratory samples	26.7	3528
Surgical site	23.8	7623
Blood	22.1	1610
Invasive punctures	17.8	715
Other	25.3	3304

**Mandatory reporting:** From 01.07.2009 to 30.06.2010 **3478** cases of MRSA-bacteremia have been reported.

**Table 3: MRSA-bacteremia-incidences from mandatory reporting**

Mandatory reporting	Incidences Cases/100,000 inhabitants/year
<b>MRSA-bacteremia</b>	4.3
<b>MSSA-bacteremia*</b>	15.2
<b><i>S. aureus</i>-bacteremia*</b>	19.5
<b>Sex</b>	
Male	6.1
Female	3.6
<b>Age</b>	
<1	1.2
1-15	0.1
16-29	0.3
30-49	0.9
50-59	3.6
60-69	8.3
>=70	20.5

\*Extrapolation on the basis of ARS-Data

91.6% have been diagnosed in the hospital setting. Stratification by federal states shows considerable regional differences (range:1.8-6.4/100,000 inhabitants/ year), which were positively correlated to regional MRSA-rates generated in ARS (spearman correlation coefficient: 0.74; p=0.04).

## Conclusions

Mandatory reporting provides an estimate of the burden of invasive MRSA-infections, while ARS offers a more detailed view on the MRSA-situation in hospital and ambulatory care. High MRSA-proportions in urine samples, surgical ICUs and particular medical specialities such as geriatric, nephrological and urological general wards, urological medical practices and regional differences point out areas which need further investigations. The joint view of the results of both surveillance systems provides a more comprehensive picture of the MRSA-situation and helps to identify vulnerable areas.