P1268

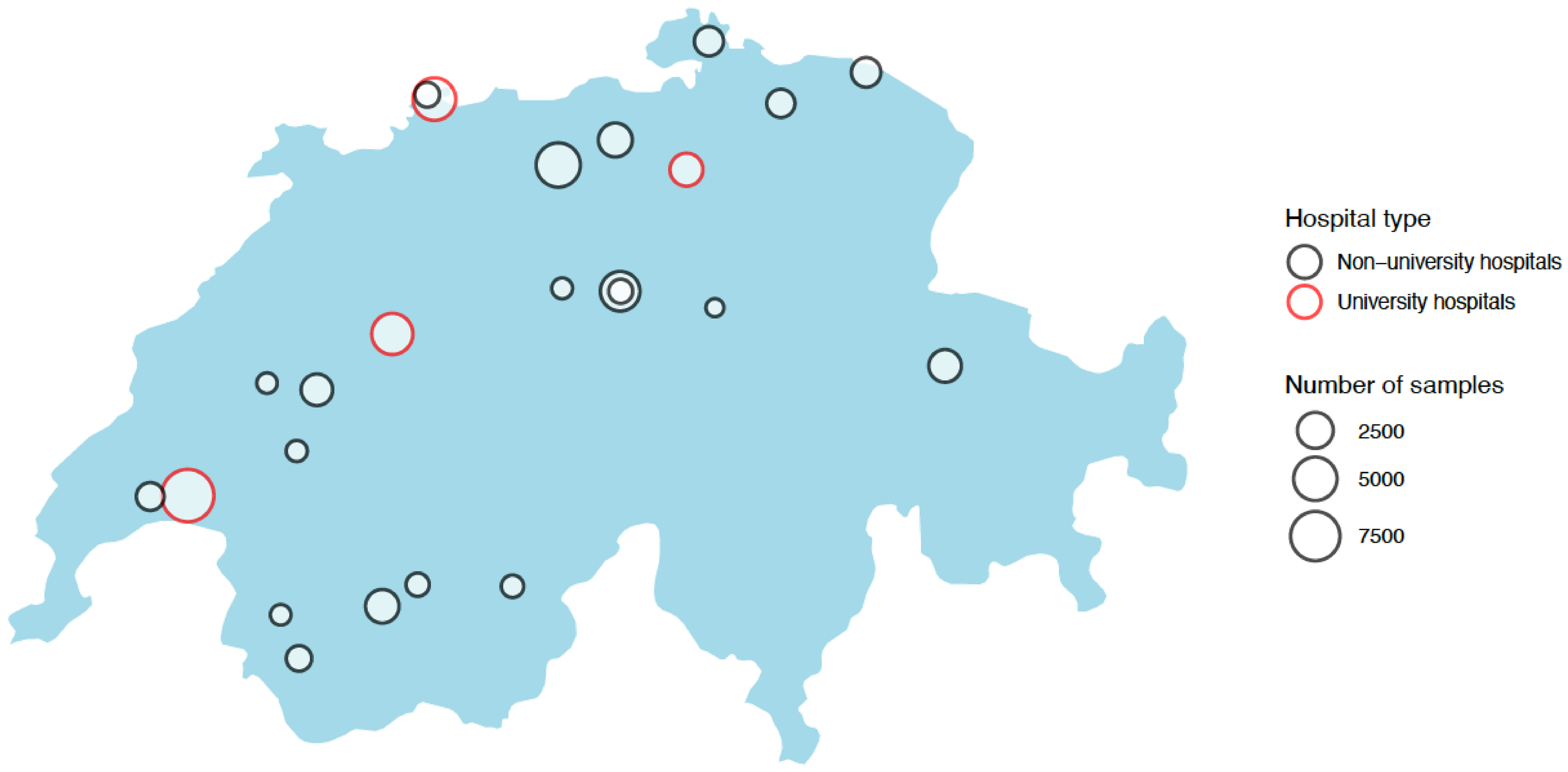
Surveillance of temporal trends and antimicrobial resistance in nosocomial respiratory pathogens, Switzerland, 2007 to 2022

Christian Bischof[1, 2], Andreas Kronenberg[3, 4], Rami Sommerstein[1,5] and the Swiss Centre for Antibiotic resistance (ANRESIS)

[1]Faculty of Healthcare Sciences and Medicine, University of Lucerne, Lucerne, Switzerland; [2]Department of Internal Medicine, Hospital of Nidwalden and Lucerne Cantonal Hospital, Lucerne, Switzerland; [3]Institute for Infectious Diseases (IFIK), Berne University Hospital, Berne, Switzerland; [4]Swiss Centre for Antibiotic Resistance (ANRESIS), Berne University Hospital, Berne, Switzerland
[5]Department of Infectious Diseases, Berne University Hospital, Berne, Switzerland;

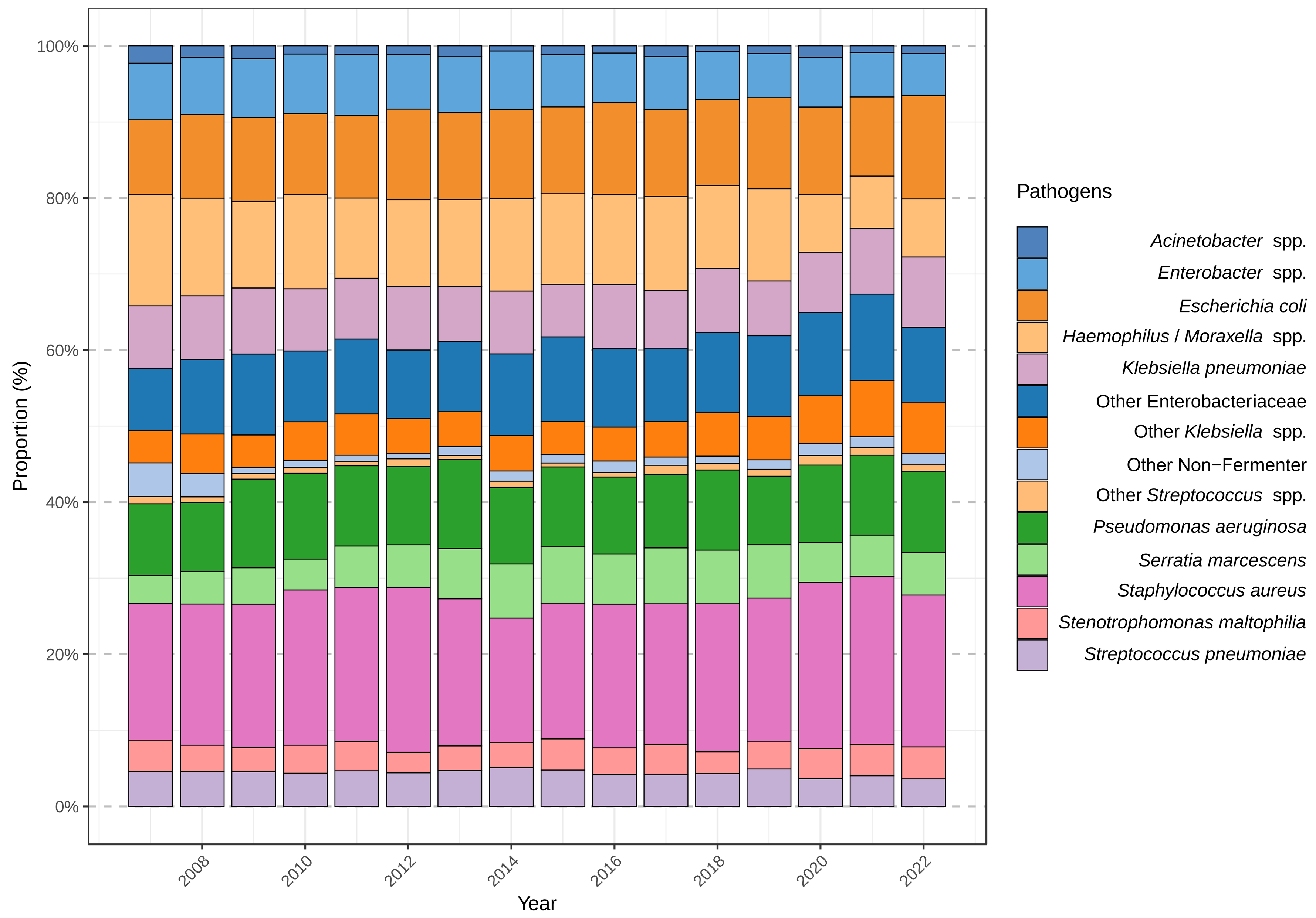
Background: Hospital-acquired pneumonia is one of the most common nosocomial infections. However, no systematic surveillance data exist on respiratory lower tract pathogens in Switzerland.

Method: We analysed 41,602 respiratory samples from the Swiss Centre for Antibiotic Resistance (ANRESIS) database to track trends in pathogen distribution and resistance patterns. Therefore, we calculated resistance rate (RR), unadjusted (IRR) and adjusted incidence rate ratio (aIRR), comparing the periods 2007–2014 and 2015–2022.



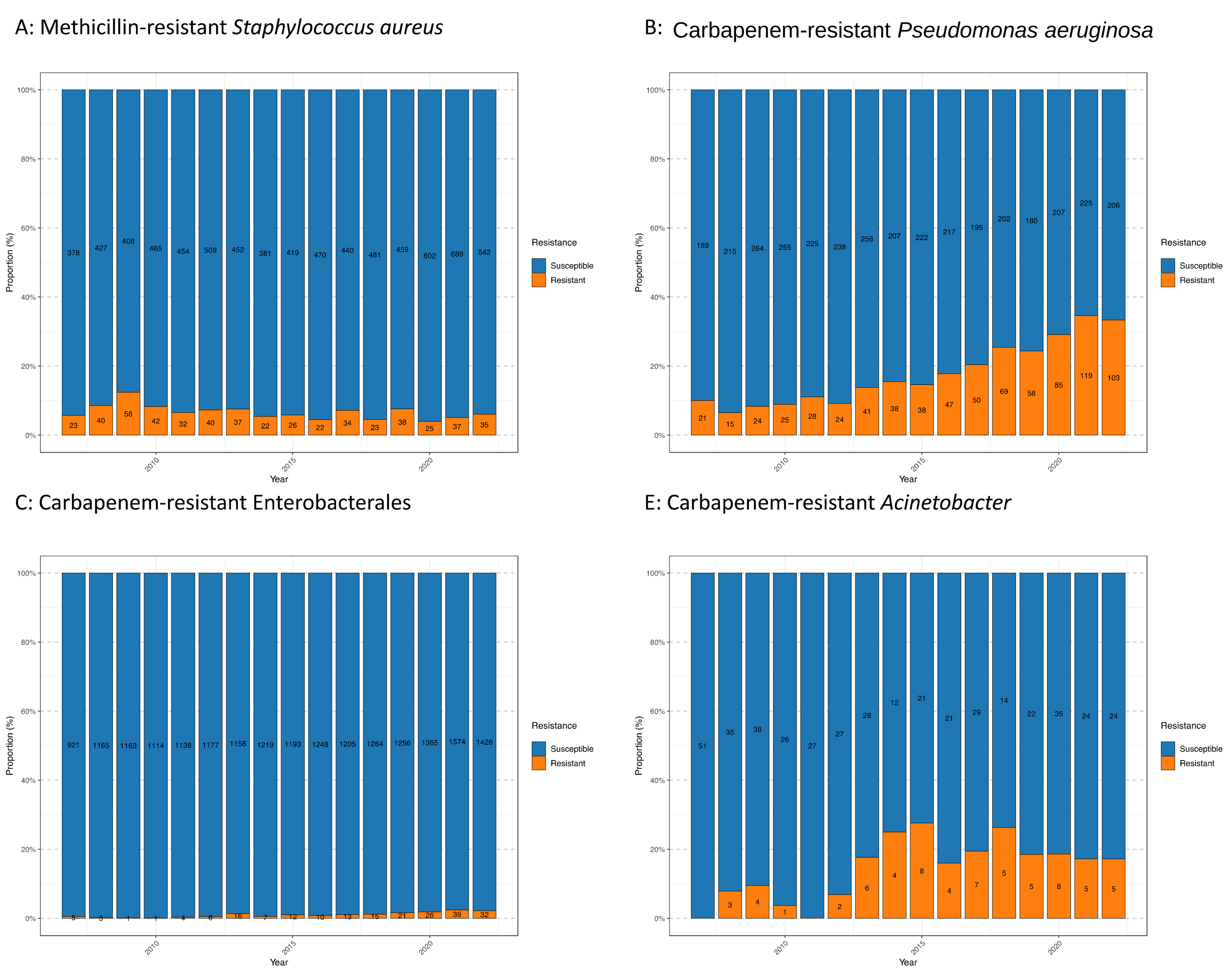
Data Source and Representativeness

We included hospitals reporting days since admission along microbiological samples and submitting at least 10 respiratory samples (sputum, tracheobronchial secretions, and bronchoalveolar lavage) annually, resulting in data from 24 Swiss acute care hospitals.



Temporal distribution of pathogens

Temporal analysis revealed significant increase in *Serratia marcescens* (IRR 1.23, 95% CI 1.13–1.33, p < 0.001) and decrease in *Acinetobacter* spp. (IRR 0.80, 95% CI 0.67–0.95, p = 0.01). *Staphylococcus aureus and Pseudomonas aeruginosa* were stable.



Overview resistance rates				Univariate Analysis		Multivariate Analysis [1]	
Resistance rate 2007–2012		Resistance rate 2015–2022		IRR 2015–2022 (Reference: 2007–2014)		aIRR 2015–2022 (Reference: 2007–2014)	
n/n	%	n/n	%	IRR (95% CI)	p-value	aIRR (95% CI)	p-value
Methicillin resistance within Staphylococcus aureus (534/8,110 = 6.5%)							
294/3,768	7.8	240/4,342	5.5	0.69 (0.57–0.82)	< 0.001	0.71 (0.59–0.85)	< 0.001
Third-generation cephalosporin resistance within Enterobacterales (2,948/19,829 = 14.9%)							
1,541/9,079	17.0	1,407/10,703	13.1	0.74 (0.68–0.80)	< 0.001	0.73 (0.67–0.79)	< 0.001
Carbapenem resistance within Enterobacterales (211/19,829 = 1.0%)							
43/9,098	0.5	168/10,701	1.6	3.36 (2.42–4.76)	< 0.001	3.35 (2.42–4.76)	< 0.001
Carbapenem resistance within Pseudomonas aeruginosa (785/4,288 = 18.3%)							
216/2,065	10.5	569/2,223	25.6	2.95 (2.49–3.50)	< 0.001	3.42 (2.86–4.11)	< 0.001
Carbapenem resistance within Acinetobacter spp. (67/501 = 13.3%)							
20/264	7.6	47/237	19.8	3.02 (1.75–5.37)	< 0.001	2.65 (1.46–4.93)	0.002

[1] Adjusted for covariates: sex, age, region, hospital type, hospital department, recovery method, time of sampling

Temporal distribution of resistance rates

The analysis of antimicrobial resistance rates revealed distinct trends across specific bacterial groups. Left: bar charts over the study period. Right: calculation of RR, IRR and aIRR comparing the periods 2007–2014 and 2015–2022.

Key result 1: The temporal distribution of respiratory pathogens revealed a statistically significant increase in challenging Enterobacterales, such as *Serratia* spp.

Key result 2: MRSA (RR -2.3%; aIRR 0.71, CI 0.59–0.85, p < 0.001) and resistance to third-generation cephalosporins in Enterobacterales (RR -3.9%; aIRR 0.73, CI 0.67–0.79, p < 0.001) declined throught the two study periods, while carbapenem resistance significantly increased in Enterobacterales (RR +1.1%; aIRR 3.35, CI 2.42–4.76, p < 0.001*), Pseudomonas aeruginosa* (RR +15.1%; aIRR 3.42, CI 2.86–4.11, p < 0.001) and *Acinetobacter* spp. (RR +12.2%; aIRR 2.65, CI 1.46–4.93, p = 0.002)

ESCMID Global
Congress of the European Society of Clinical Microbiology and Infectious Diseases