7.4 *Acinetobacter* spp.

Acinetobacter spp. are Gram-negative, strictly aerobic coccobacilli. These opportunistic pathogens have an increased capacity to survive for longer periods in the hospital environment, can be found in soil and water too, and are intrinsically resistant to many antibiotic agents. *Acinetobacter* spp. can roughly be divided into two groups: the *Acinetobacter calcoaceticus – Acinetobacter baumannii* (ACB) complex and the non-ACB group, including a large number of environmental species with low pathogenicity. Because a correct identification on the species level is difficult, hereinafter only resistance trends on the genus level, in accordance with the European resistance networks EARS-Net and CAESAR, are analyzed.

Acinetobacter spp. infections are an important concern regarding hospital-acquired infections in immunocompromised patients. They can cause respiratory, urinary and wound infections, and septicemia. Meningitis has been reported as well. Risk factors for multidrug-resistant *Acinetobacter* spp. are severe underlying diseases and prolonged hospital stays, especially in ICUs during antibiotic administration and/or mechanical ventilation.

In general, resistance rates between 9.5% and 13.7% were observed for all antibiotics analyzed (Table 7. g) in 2021, pan-susceptibility was noted in 83.2% of the isolates (Table 7. h). Interestingly resistance rates were lower in 2018 and 2019, but increased again in 2020 and 2021 to the levels of earlier years (Figure 7. h). Over the last ten years, resistance rates were relatively stable, with the exception of a significant decrease in trimethoprim-sulfamethoxazole resistance from 20.5% in 2012 to 9.5% in 2021 (Table 7. g). With the exception of aminoglycosides, resistance rates were lower in the western part of Switzerland than in the northeastern part. Resistance rates in Switzerland were much lower than the EU/EEA population weighted means in 2020 (carbapenems 38%, fluoroquinolones 41.8%, aminoglycosides 37.1%) [2]. A detailed analysis on carbapenem resistances performed by ANRESIS showed stable resistance rates from 2005 to 2016 [9].

Table 7. g: Resistance rates of invasive *Acinetobacter* spp. isolates in humans in 2021.

Acinetobacter spp.											**2021**
	West		**North–East**		**South**		**Total**			**Trend**	
Antimicrobial	**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**	**95% CI**	**4y**	**10y**
Carbapenems[1]	27	7.4	70	11.4	6	16.7	103	10.7	7.7–13.7	↑	–
Aminoglycosides	27	14.8	69	13	6	16.7	102	13.7	10.3–17.1	–	–
Trimethoprim-sulfamethoxazole	27	7.4	63	11.1	5	0	95	9.5	6.5–12.5	–	↓
Ciprofloxacin	26	7.7	64	15.6	6	16.7	96	13.5	10.0–17.0	↑	–

[1] Carbapenems: imipenem, meropenem

West (GE, NE, VD, JU, FR), South (TI), North–East (other cantons), according to linguistic regions. 95% confidence intervals (CI) were calculated by the Wilson score method, calculations of trends were performed by logistic regression. Trends were modeled with logistic regressions. Arrows represent a significant effect ($p < 0.05$) of the year on the corresponding outcome (increase, decrease).

Figure 7. h: Resistance rates of invasive *Acinetobacter* spp. isolates in humans between 2012 and 2021.

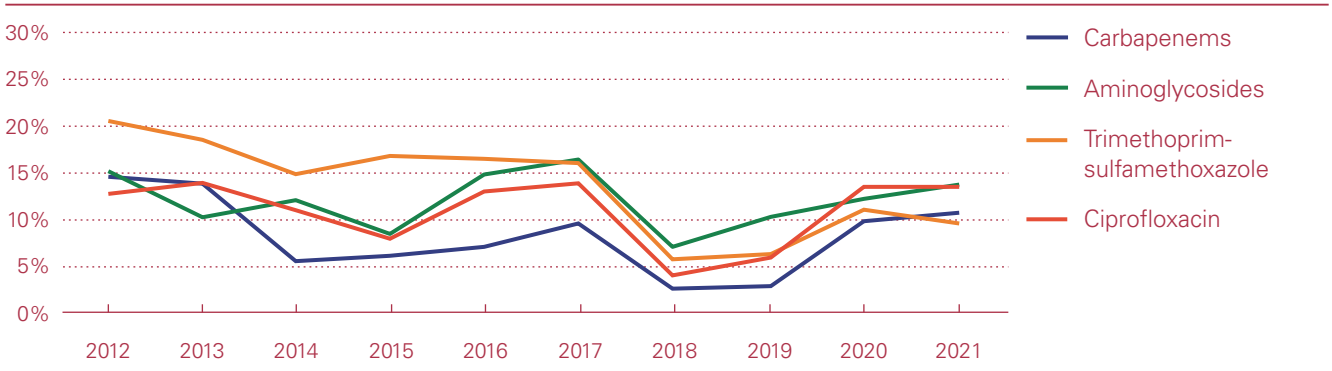

Table 7. h: Resistance combinations in invasive *Acinetobacter* spp. isolates in humans in 2021. Only isolates tested against all three antibiotic groups (aminoglycosides, ciprofloxacin and carbapenems) were considered (n = 95/103 [92.2 %]).

Resistance patterns	Number of isolates	% of total
Fully susceptible	**79**	**83.2%**
Resistance to one antimicrobial group	**4**	**4.2%**
Ciprofloxacin	2	2.1%
Aminoglycoside	2	2.1%
Resistance to two antimicrobial groups	**2**	**2.1%**
Aminoglycoside + ciprofloxacin	1	1.1%
Aminoglycoside + carbapenems	1	1.1%
Resistance to all three antimicrobial groups	**10**	**10.5%**
Aminoglycoside + carbapenems + ciprofloxacin	10	10.5%

Figure 7. i: Multiresistance in invasive *Acinetobacter* spp. isolates in humans between 2012 and 2021 (for details refer to Table 7.h).