

O0712 Influence of local outdoor temperature on incidence of extended-spectrum beta-lactamase-producing *Enterobacteriaceae*

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Background: There is emerging evidence that, in addition to increasing antibiotic use and consecutive selective pressure, environmental factors may contribute to the rise of antimicrobial resistance. A link between local temperature and a rise in extended-spectrum betalactamase (ESBL)-producing *Enterobacteriaceae* during summer months has been reported, a potential mechanism being facilitation of horizontal gene transfer at higher temperatures. We aim to investigate the association between outside temperature and the incidence of ESBL-producing *Enterobacteriaceae*.

Materials/methods: We performed a time-series regression study using prospectively collected surveillance data on all ESBL-producing *Enterobacteriaceae* isolated from in- and outpatients at the University Hospital Basel, Switzerland between 01/2008-12/2017. Temperature was measured hourly at the meteorological institute next to our institution. ANOVA analyses correcting for multiple comparisons were applied to compare mean temperatures. A time series approach using a Poisson regression model was performed to assess associations between mean, minimal and maximal weekly temperature and the number of ESBL-producing *Enterobacteriaceae* correcting for the long-term trend of increasing resistance towards third generation cephalosporins.

Results: Over the 10-year study period, recovery of ESBL-producing *Enterobacteriaceae* increased significantly (annual incidence rate ratio [IRR] 1.14, 95%CI 1.13-1.16), while mean, minimal and maximal weekly temperature did not change (ANOVA-p-values 0.567, 0.329, and 0.513, respectively). In univariable analyses, increasing temperature was associated with higher recovery rates of ESBL-producing *Enterobacteriaceae*, which remained significant after correcting for the long-term trend of increasing resistance towards third generation cephalosporins, except for the association between mean weekly temperature and recovery of ESBL-*E. coli* (table).

Conclusions: Our findings suggest an association between incidence of ESBL-producing *Enterobacteriaceae* and temperature, however, further adjustments for potential confounders are still ongoing.

Table

	Crude analyses	Adjusted analyses*				
	Incidence rate ratio	95% confidence interval	p-value	Incidence rate ratio	95% confidence interval	p-value
Minimal weekly temperature						
ESBL- <i>E. coli</i>	1.01	1.00-1.02	<0.001	1.01	1.00-1.01	0.006
ESBL- <i>K. pneumoniae</i>	1.02	1.01-1.03	0.003	1.01	1.00-1.03	0.036
Mean weekly temperature						
ESBL- <i>E. coli</i>	1.01	1.00-1.01	0.022	1.00	0.99-1.01	0.128
ESBL- <i>K. pneumoniae</i>	1.02	1.01-1.03	0.003	1.01	1.00-1.02	0.012

* correcting for the long-term trend of increasing resistance towards third generation cephalosporins