

The effect of the SARS-CoV-2 pandemic on community-acquired blood stream infections with extended-spectrum β -lactamase-producing *Escherichia coli* in Switzerland

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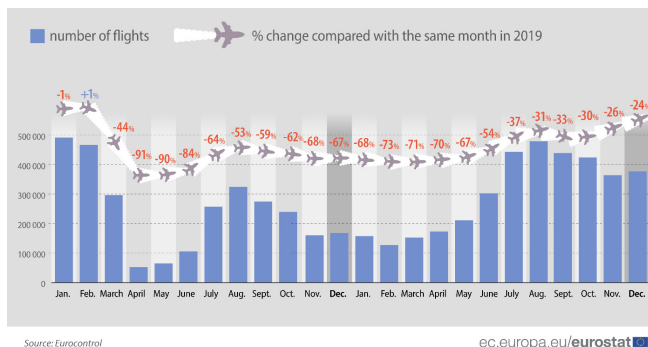
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Introduction

International travel is a known risk factor for colonization (1,2) and infection (3,4) with extended-spectrum β -lactamase (ESBL)-producing Enterobacterales, especially *Escherichia coli*. While colonization rates in returning travellers can be as high as 90% (1), data on the absolute effect of international travel on the incidence of community-acquired infections with ESBL-producing *E. coli* is lacking.

During the SARS-CoV-2 pandemic, international travel was severely restricted. In 2020 and 2021, the number of flight passengers worldwide amounted to 1.8 billion and 2.2 billion, a reduction of 60.2% and a 50.0% compared to 2019 (www.iata.org). In the European Union, flight numbers went down as much as 91% at certain points in time compared to 2019 in 2020 (see Figure 1).

Figure 1: Commercial flights in the EU in 2020 and 2021



Aim

To assess the effect of the SARS-CoV-2 pandemic and its associated travelling ban on the ESBL rate in *E. coli* causing community-acquired blood stream infections in Switzerland.

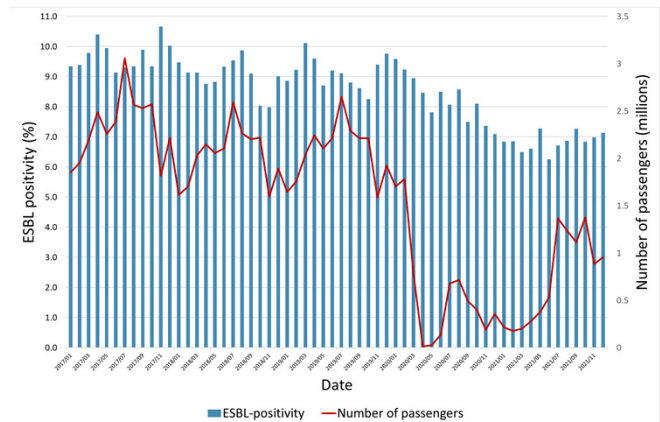
Methods

Monthly data on the proportion of ESBL-positivity in community-acquired blood stream infections with *E. coli* before (01/2017-02/2020) and during the SARS-CoV-2 pandemic (03/2020-12/2021) were compared using the Wilcoxon rank sum test. Blood stream infections were considered community-acquired if the positive blood cultures were taken within 48 hours after hospitalization. Additionally, the monthly proportion of ESBLs among all *E. coli* strains identified in blood stream infections were correlated with the monthly number of Swiss passengers departing from airports in Switzerland during the same time period using nonparametric measure of rank correlation (Spearman correlation).

Results

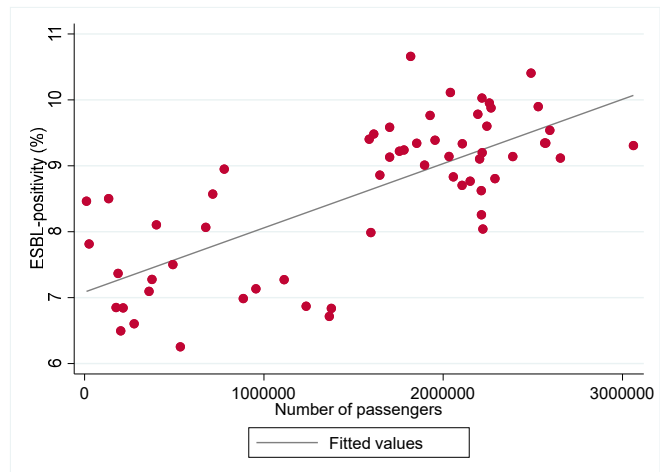
The average monthly proportion of ESBL-positivity in community-acquired blood stream infections with *E. coli* went down by almost one fifth during the SARS-CoV-2 pandemic, from 9.3% (95% CI 9.1-9.5%) pre-pandemic to 7.3% (95% CI 7.0-7.6%), a statistically significant difference ($p < 0.001$).

Figure 2: Proportion of ESBL-positivity and number of passengers (2017-2021)



Furthermore, a strong positive correlation between the monthly number of air passengers departing from airports in Switzerland and the monthly proportion of ESBL-positivity in community acquired blood stream infections with *E. coli* could be observed ($r_s = 0.68$, $p < 0.001$).

Figure 3: Association between number of passengers and ESBL-positivity (%) in community-acquired blood stream infections by month



Conclusion

During the SARS-CoV-2 pandemic, a decrease in the proportion of ESBL-positivity in community-acquired blood stream infections with *E. coli* could be observed. One possible explanation is the reduction in international travel during the pandemic.

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