

Impact of the COVID-19 Pandemic on Inpatient Antibiotic Consumption in Switzerland

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Background&Aim

- The COVID-19 outbreak placed an enormous burden on health-care systems [1].
- Clinical uncertainty and the lack of effective treatment options for SARS-CoV-2 led to a large proportion of COVID-19 patients being treated with antibiotics, although the incidence of secondary bacterial infections was low [2].
- Initial studies in other European countries showed that antibiotics were increasingly used during the pandemic, especially broad-spectrum antibiotics [3,4].

The aim of this study was to analyze inpatient antibiotic consumption during the first 16 months of the COVID-19 pandemic in Switzerland.

Results

- For the entire hospital antibiotic consumption remained stable. An increase of 4.2% was observed in the ICU in the first COVID-19 year compared to 2019 (Fig. 1A).
- The increase in broad-spectrum antibiotic use was +12.3% for the entire hospital and +17.3% in the ICU only (Fig. 1B).

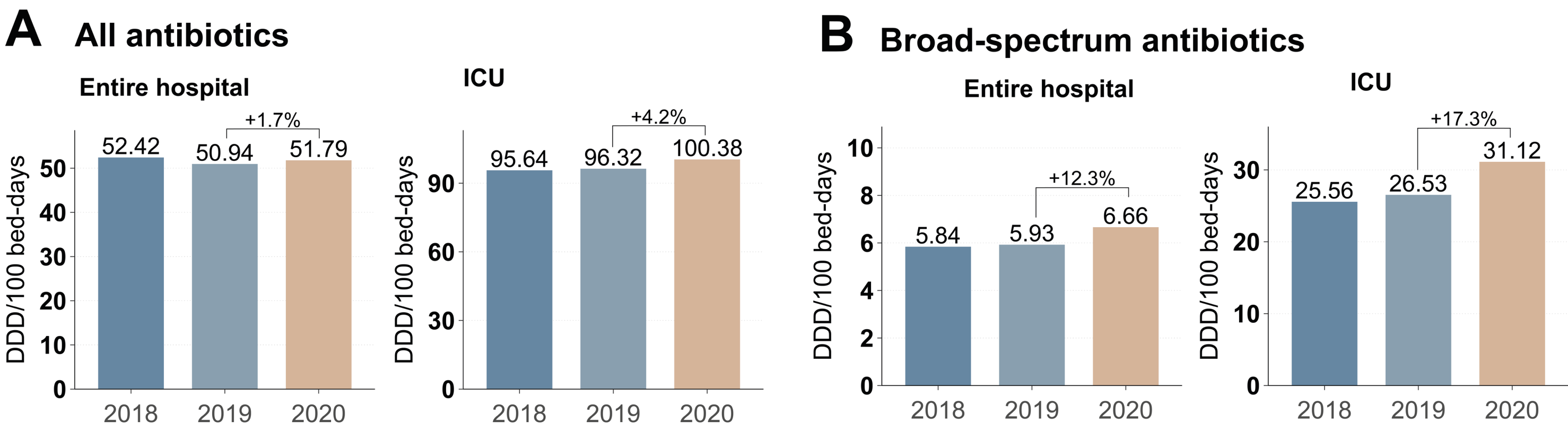


Figure 1 Change in antibiotic consumption in the entire hospital and in the ICU of A) all antibiotics and B) broad-spectrum antibiotics alone, between 2018 and 2020 in the hospitals (N=55) that participated in ANRESIS monitoring.

- The sub-analysis of the monthly data showed, that antibiotic use was increased in the first wave and tended to be lower in the intermediate period, than in the pre-COVID period. In addition, more broad-spectrum antibiotics were used during the first wave and at the beginning of the second wave (Fig. 2).
- These effects were more pronounced in the ICU.

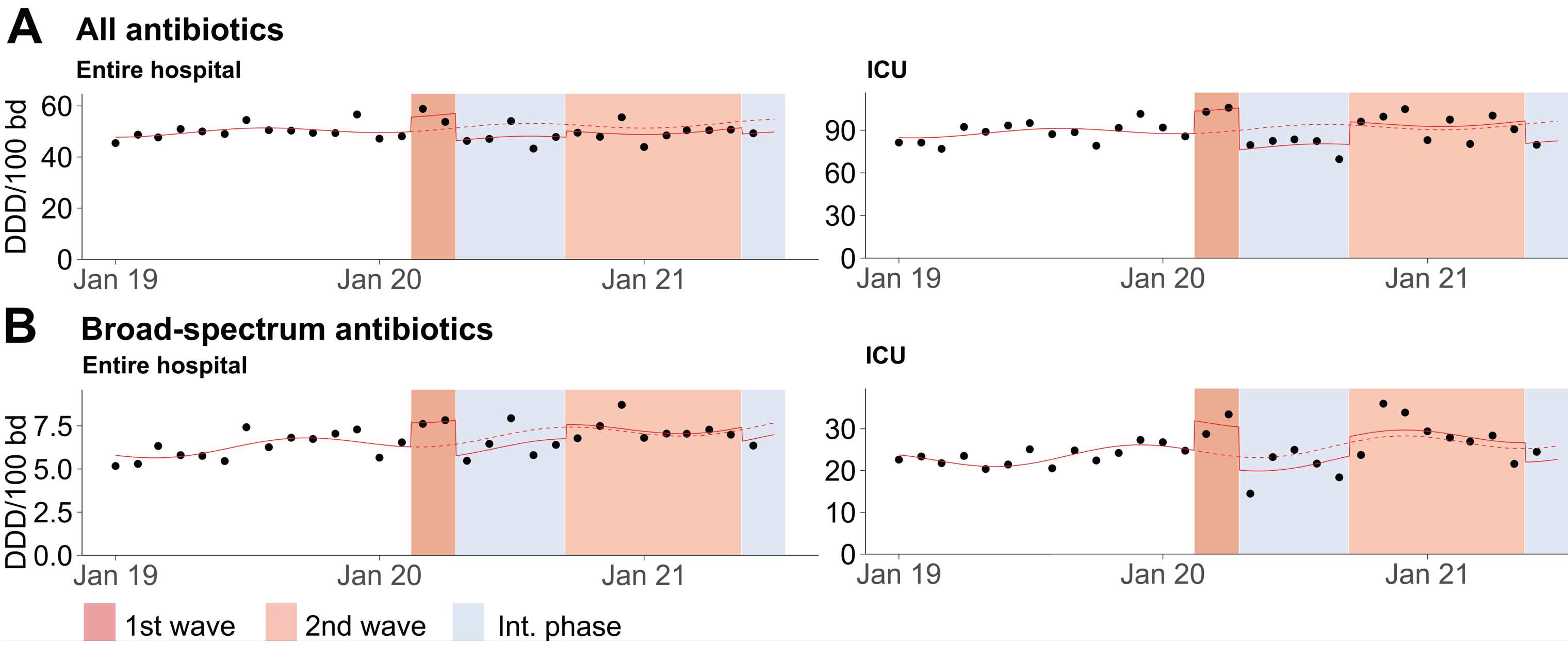


Figure 2 ITS analysis of monthly antibiotic consumption using the monthly ANRESIS subset for (A) all antibiotics for and (B) broad-spectrum antibiotics only, for the entire hospital and ICUs.

Method

- For this retrospective observational study data from the ANRESIS sentinel network with annual data from 56 acute care hospitals, including four hospitals providing monthly data, was used.
- An interrupted time series (ITS) analysis was used to model monthly consumption in four hospitals during different COVID-19 pandemic periods. A Pearson correlation analysis was performed to examine a possible relationship between the number of hospitalised COVID-19 patients and antibiotic consumption.

- No correlation was found between the number of COVID-19 patients and total antibiotic consumption in the entire hospital. A weak positive correlation was found for the ICU (Fig. 3A).
- For broad-spectrum antibiotics only, a positive correlation between consumption and the number of hospitalised COVID-19 patients was found for both the entire hospital and the ICU (Fig. 3B).

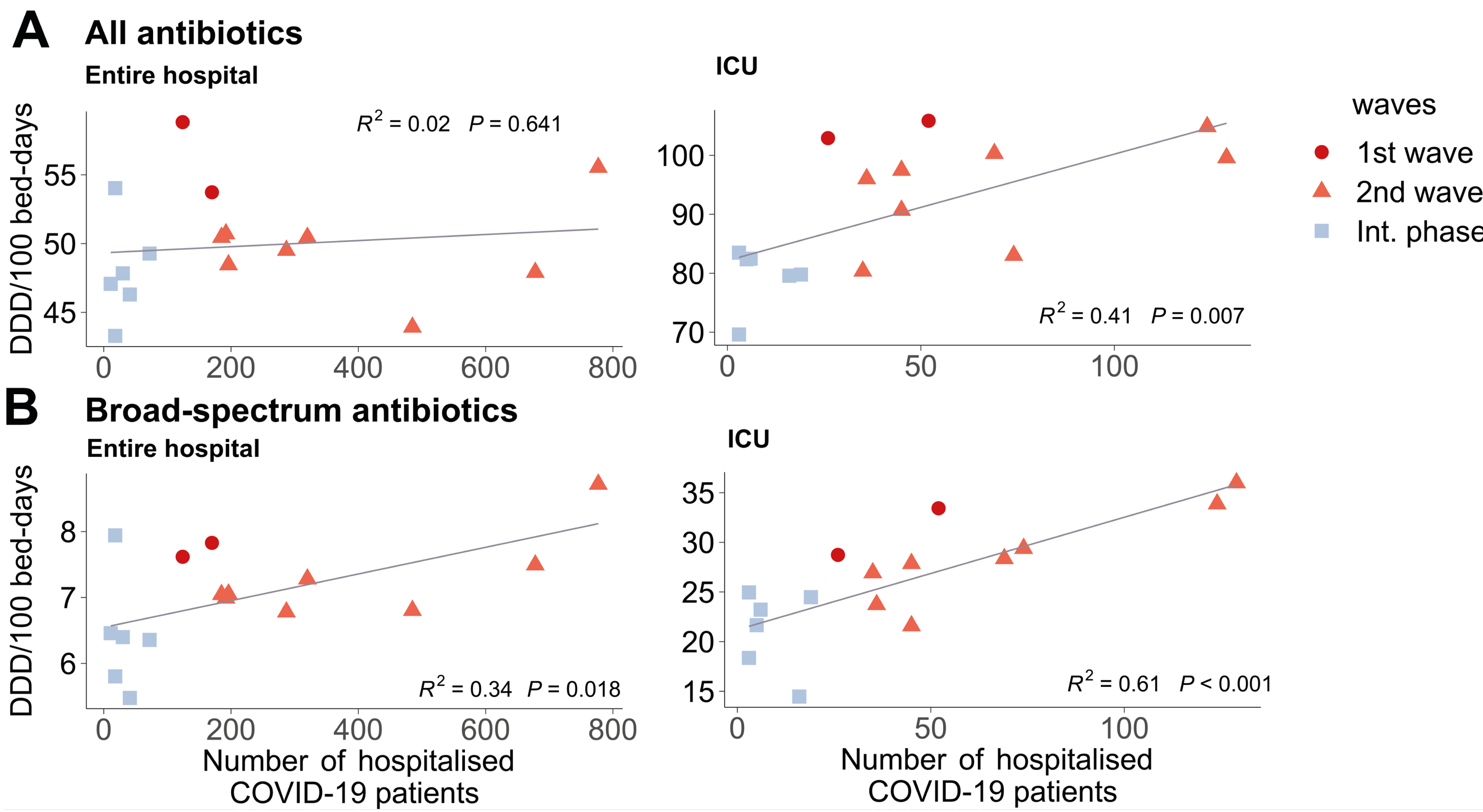


Figure 3 Correlation analysis for the entire hospital (left) and for ICU (right) based on aggregated data from the four hospitals with monthly antibiotic consumption data and the number of hospitalised COVID-19 patients for A) all antibiotics (top row) and B) broad-spectrum antibiotics only.

Conclusions

Inpatient antibiotic use was higher than expected during the first wave, and for broad-spectrum antibiotics only, also at the beginning of the second wave. Particularly in ICUs, the use of broad-spectrum antibiotics correlated with the number of hospitalised COVID-19 patients.

References

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