



Antimicrobial prescriptions among physicians participating in the Swiss Sentinella network from 2017 to 2022: a cross-sectional study.

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INTRODUCTION

Understanding antimicrobial prescription patterns helps to define public health strategies to improve prescription appropriateness. We analyzed the antimicrobial prescriptions in ambulatory care in family medicine, using data collected through the Swiss national sentinel network (Sentinella).

Year	Total number of physicians n	Generalists n (%)	Pediatricians n (%)	Number of antimicrobial prescriptions n	Number of consultations n
2017	140	118 (84.3)	22 (15.7)	15'952	576'232
2018	143	120 (83.9)	23 (16.1)	17'375	567'510
2019	151	130 (86.1)	21 (13.9)	17'430	585'079
2020	159	136 (85.5)	23 (14.5)	14'570	566'796
2021	154	129 (83.8)	25 (16.2)	12'077	605'347
2022	149	124 (83.2)	25 (16.8)	14'020	574'685

Table 1: Distribution of number of physicians, consultations, and prescriptions, by year, within the Sentinella Network, 2017-2022.

METHODS

We examined prescriptions of antimicrobials reported in the Sentinella network between 2017 and 2022. We included all reported antimicrobial prescriptions by primary care network members, where indication was specified according to predefined categories. We excluded observation with missing data and when the physician was reporting irregularly (less than once per year).

We used as denominator the total number of consultations reported by the physicians over the year, applying the age and sex-distribution based on detailed reporting of patient characteristics during 4 weeks per year.

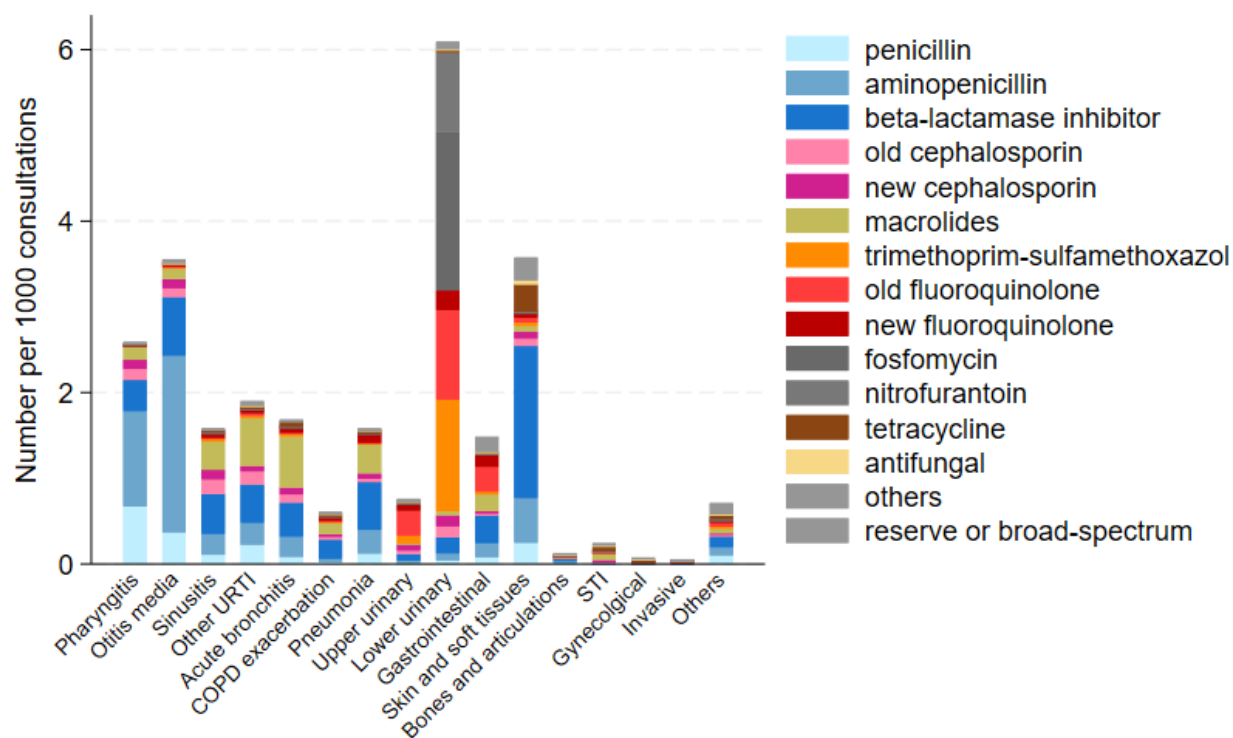


Figure 1: Total prescriptions of antimicrobial per 1000 consultations, by class, for each indications, within the Sentinella Network, 2017-2022.

URTI = upper respiratory tract infection, COPD = chronic obstructive pulmonary disease, STI = sexually transmitted infection.

LIMITATIONS

A **representation bias** can exist, as Sentinella practices may not be fully representative of all Swiss practices, and therefore our study results about antimicrobial prescription cannot be inferred to all Swiss GPs.

A **selection bias** of the physicians participating in the Sentinella network can exist, as it is fully voluntary-based and thus could lead to more motivated and interested physician to participate in data collection.

A **reporting bias** is also plausible, as the declaration system is not fully automated and transcription errors might occur.

CONCLUSIONS

Antimicrobial prescriptions in the Sentinella network **decreased between 2017 and 2022**, especially marked in 2020 and 2021 during the Covid pandemic.

In the meantime, the **total consultation number rose**, corresponding possibly to people with viral symptoms not necessitating antimicrobial prescriptions, or to an increase of the number of Sentinella members.

The same prescriptions number pattern was found for each age category but **varying greatly by the class of antimicrobial** prescribed.

Most antibiotics are prescribed for **respiratory tract infections**, followed by **urinary tract infections** and **skin infections**

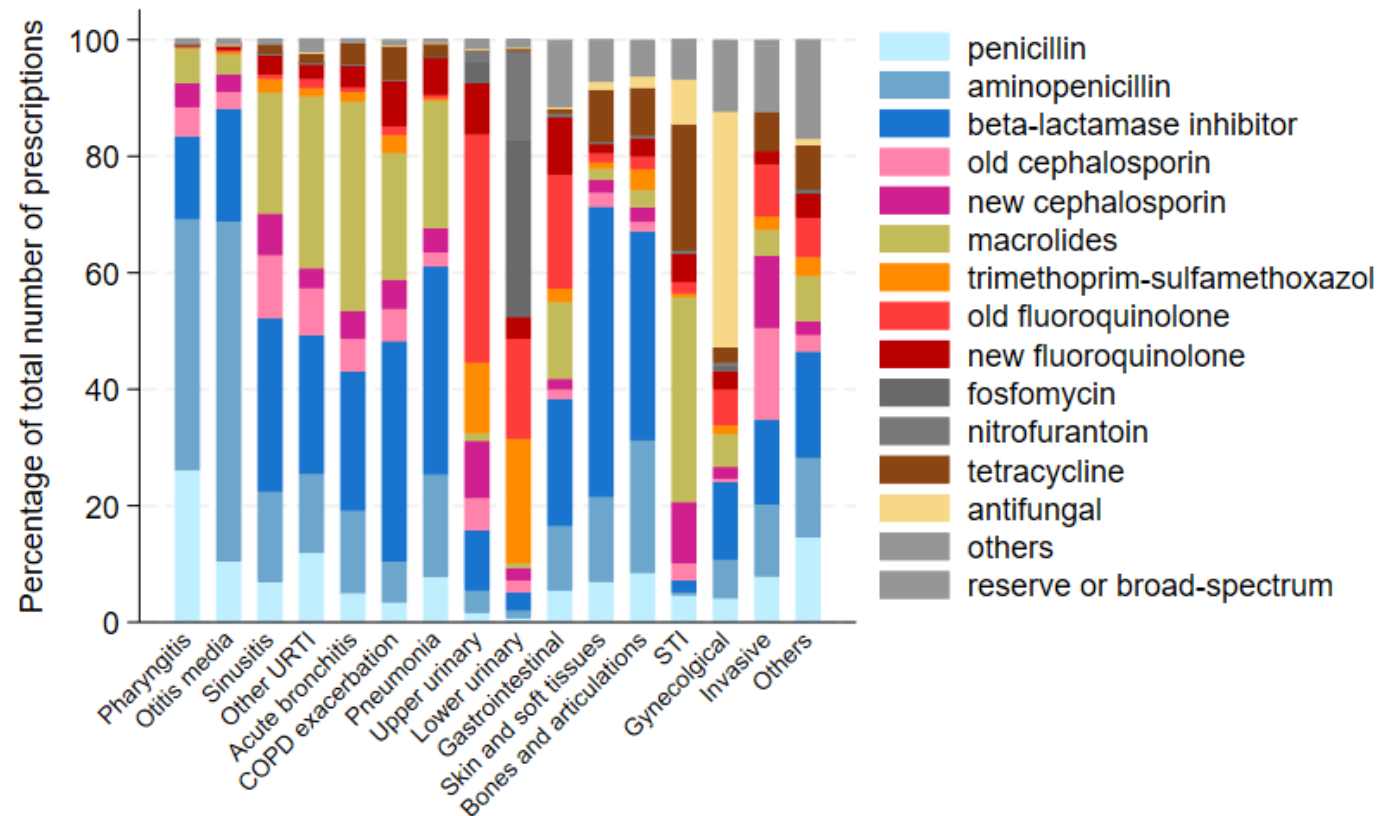


Figure 2: Percentage of antimicrobial class prescription by indication, within the Sentinella Network, 2017-2022.

URTI = upper respiratory tract infection, COPD = chronic obstructive pulmonary disease, STI = sexually transmitted infection.

RESULTS

We analyzed 91'424 antimicrobial prescriptions, reported by an average of 149.3 physician each year (95% CI [148.91, 149.75]) (table 1).

The total amount of antimicrobial prescriptions per year was between 19.95 and 30.62 per 1000 consultations. The number of prescriptions was highest for lower urinary tract infection (LUTI) at 6.08 per 1000 consultations, followed by skin and soft tissues infection (3.56 per 1000), and otitis media (3.52 per 1000). When taken together, upper respiratory tract infections (URTI) accounted for 9.53 and lower respiratory tract infections for 3.81 per 1000 consultations (figure.1)

The most prescribed antimicrobials were penicillin and derivatives (49.0%), followed by fluoroquinolones (10.3%) and macrolides (10.2%). Penicillin derivatives accounted for more than 50% of prescriptions for RTI, whereas fluoroquinolones accounted for 47.9% of upper urinary tract infections (UUTI) and 21.0% of LUTI (figure 2).

Children (<16 y.o.) had a total prescription of 22.92 per 1000 consultations compared to 29.43 for adult (16-65 y.o.) and 23.39 for older people (>65 y.o.). Children were receiving more antibiotics for upper RTI and older people more for LUTI. (figure. 3).

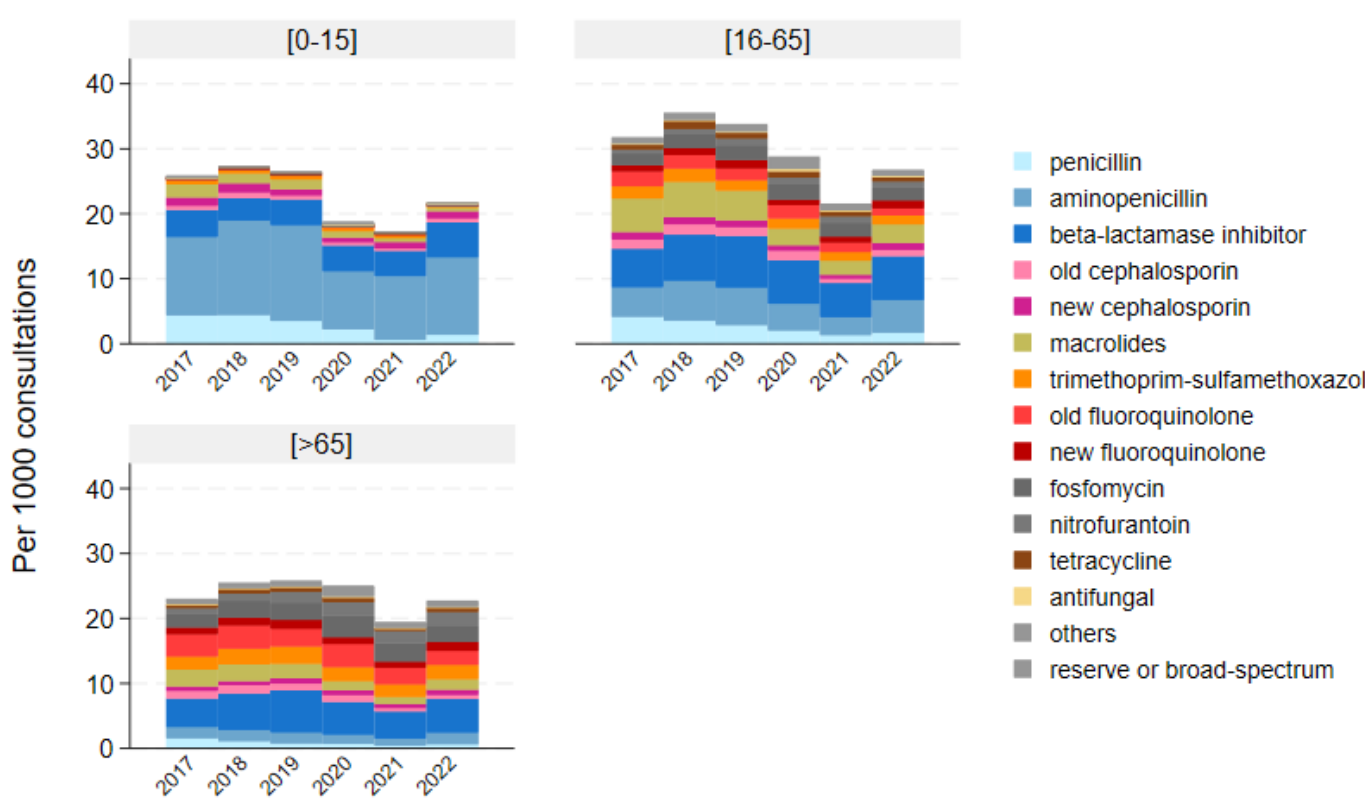


Figure 3: Total prescriptions of antimicrobial per 1000 consultations, by year, for each age category, within the Sentinella Network, 2017-2022.