

Antimicrobial consumption in the Swiss outpatient setting: Who are the most relevant prescribers?

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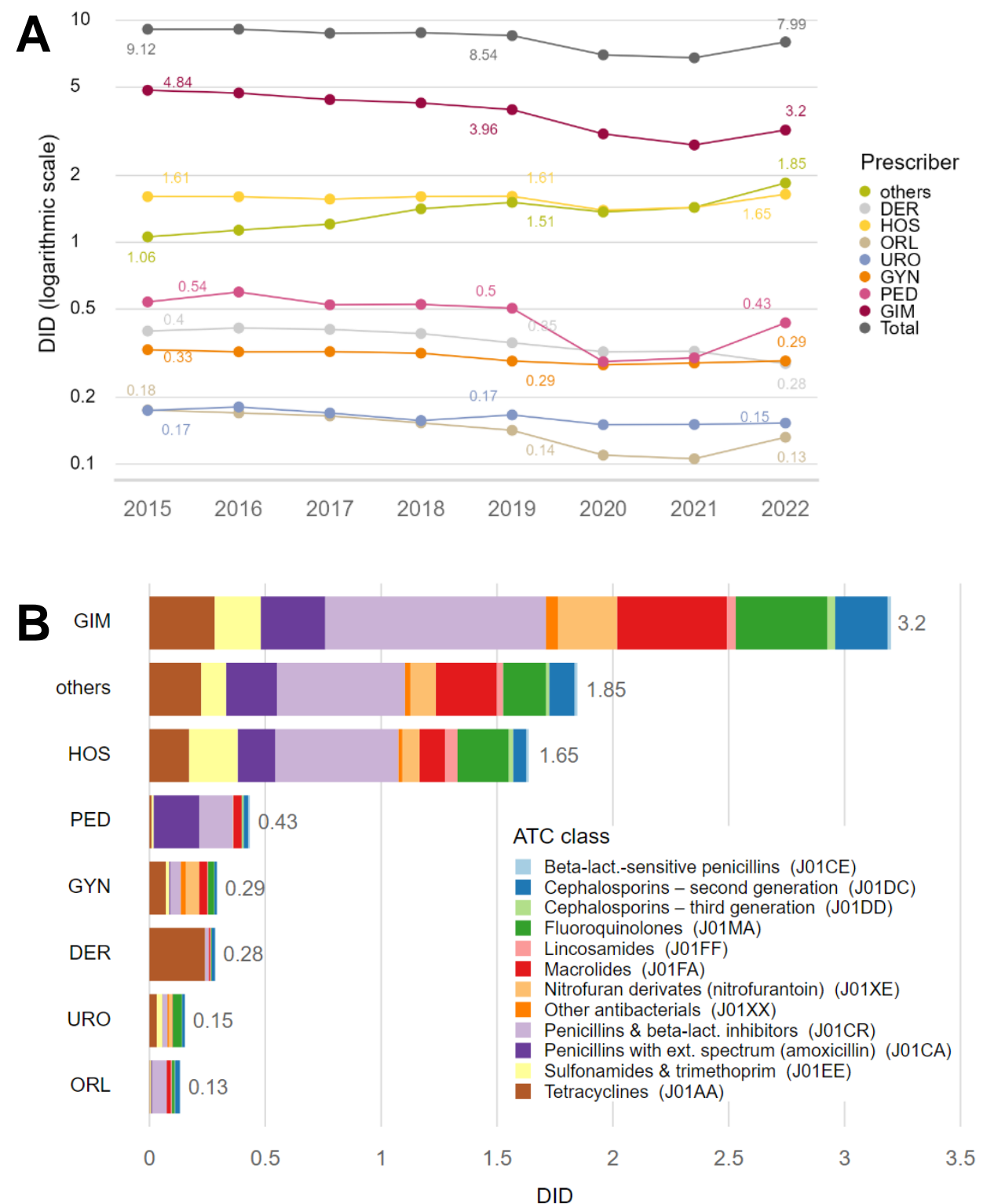
Introduction: Antimicrobial consumption (AMC) is the main driver for increasing antimicrobial resistance rates. Antibiotics are predominantly prescribed in the outpatient setting, which consists of primary care, specialist care and hospital-affiliated outpatient care. In the outpatient setting, at least 80% of antibiotic prescriptions are usually attributed to primary care. In Switzerland, current surveillance takes place at aggregated levels (inpatient vs. outpatient) and the contribution of the different prescriber groups in the outpatient setting to the overall consumption remains unknown. Thus, the study aimed to determine the contribution of the different prescribers to the overall outpatient AMC.

Methods: The study is based on a retrospective observational analysis of claims data from 2015 to 2022 provided by the Helsana insurance company. AMC was analysed in terms of all antibiotic prescriptions (WHO ATC code: J01) in the Swiss outpatient setting with regard to the respective prescriber groups. AMC was weighted according to the total population of Switzerland based on census data. AMC is reported as Defined Daily Doses per 1,000 Inhabitants per Day (DID).

Results: A total of 3,663,590 (extrapolated) antibiotic prescriptions from 49 prescriber groups were analysed. The overall AMC significantly decreased from 9.12 DID in 2015 to 7.99 DID in 2022. The largest prescriber groups were general internal medicine (40.1% of all prescribed DID in 2022), hospital-affiliated outpatient care (20.6%), group practices (17.3%), paediatrics (5.4%), and gynaecology (3.7%). In 2022, prescribers providing primary care services accounted for two thirds of all prescribed DID. The most commonly prescribed antibiotic classes were broad-spectrum penicillins, tetracyclines, and macrolides. Types and amount of antibiotics prescribed differ between the prescriber groups and over time.

Conclusion: Primary care contributed much less to the overall AMC in the Swiss outpatient setting than expected, while hospital-affiliated outpatient care was identified as a significant prescriber. This study demonstrates the feasibility of AMC surveillance at the prescriber level, and the associated valuable role of healthcare claims data. Surveillance at the prescriber level allows for identification of prescribing patterns within all prescriber groups, providing unprecedented visibility and enabling more targeted antibiotic stewardship.

Figure 1: Contribution of the main different prescriber groups to the overall antimicrobial consumption in the Swiss outpatient setting 2015 – 2022 (panel A) and antimicrobial consumption by antibiotic class and prescriber group in 2022 (panel B).



DID: Defined Daily Doses per 1000 Inhabitants per Day. Prescriber groups: DER: Dermatology, GIM: General internal medicine (family medicine and internal medicine), GYN: Gynaecology, HOS: Hospital affiliated outpatient clinics, ORL: Otorhinolaryngology, PED: Paediatrics, URO: Urology. Numbers represent extrapolations for the entire Swiss outpatient setting.

Table: The 30 most important antibiotic prescriber groups on overall outpatient antimicrobial consumption in 2022, measured as % of total DID.

Rank	Prescriber group	Contribution
1	General internal medicine	40.1%
2	Hospital affiliated outpatient clinics	20.6%
3	Group practices ^a	17.3%
4	Paediatrics	5.4%
5	Gynaecology	3.7%
6	Dermatology and venereology	3.6%
7	Urology	1.9%
8	Otorhinolaryngology	1.7%
9	Pulmonology	0.8%
10	Surgery	0.5%
11	Gastroenterology	0.4%
12	Rheumatology	0.4%
13	Ophthalmology	0.4%
14	Medical Oncology	0.3%
15	Cardiology	0.3%
16	Orthopaedic surgery and traumatology of the musculoskeletal system	0.3%
17	Plastic, reconstructive and aesthetic surgery	0.2%
18	Maxillofacial surgery	0.2%
19	Nephrology	0.2%
20	Endocrinology and Diabetes	0.2%
21	Infectious diseases	0.2%
22	Psychiatry and psychotherapy	0.2%
23	Neurology	0.2%
24	Allergology and clinical immunology	0.2%
25	Physical medicine and rehabilitation	0.2%
26	Haematology	0.1%
27	Neurosurgery	0.1%
28	Anaesthesiology	0.1%
29	Child and adolescent psychiatry and psychotherapy	<0.1%
30	Angiology	<0.1%
Primary Care Setting ^b		66.5%
Primary Care Setting (conservative approach) ^b		49.2%

^a Practices with services of at least two different prescriber groups.
^b The primary care setting include 1) General internal medicine, 2) Paediatrics, and 3) Gynaecology. In the conservative approach, prescriptions by group practices were excluded in the primary care setting.